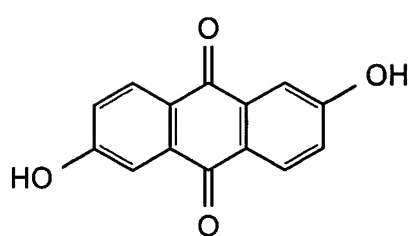
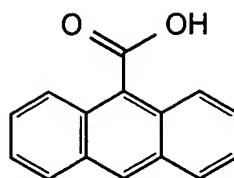


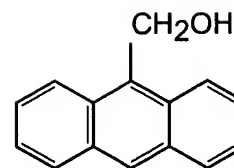
FIG. 1A



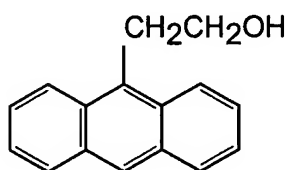
anthraflavic acid  
1



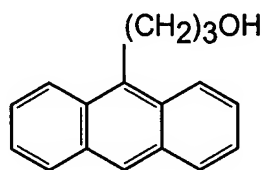
9-anthracene carboxylic acid  
2



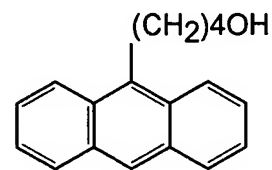
9-anthracene methanol  
3



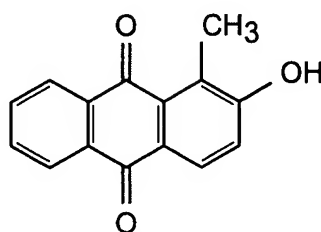
9-anthracene ethanol  
4



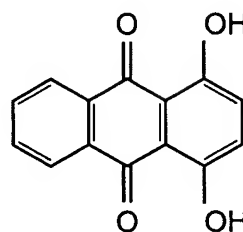
9-anthracene propanol  
5



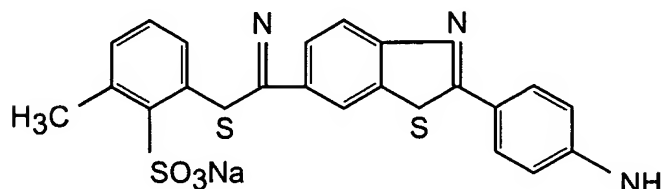
9-anthracene butanol  
6



alizarin  
7

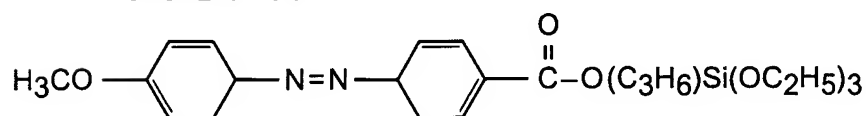


quinizarin  
8



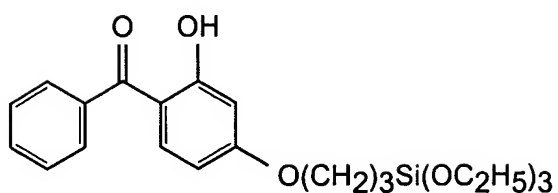
primuline  
9

FIG. 1F

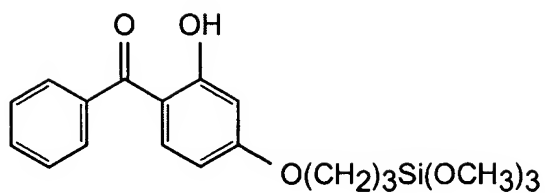


4-methoxyphenylazobenzene-4-carboxy  
propyl triethoxysilane  
41

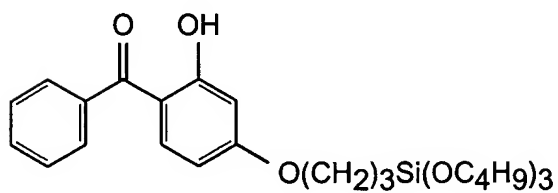
## FIG. 1B



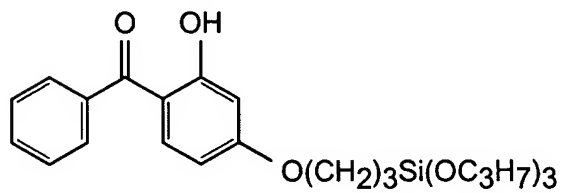
2-hydroxy-4-(3-triethoxysilylpropoxy)-  
diphenylketone  
10



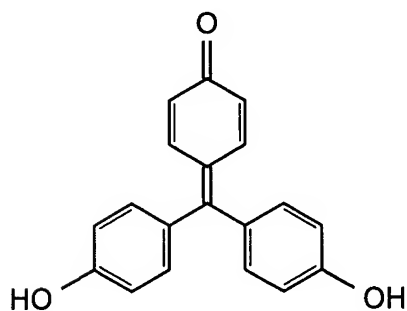
2-hydroxy-4-(3-trimethoxysilylpropoxy)-  
diphenylketone  
11



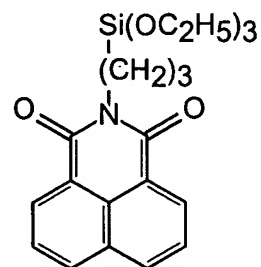
2-hydroxy-4-(3-tributoxysilylpropoxy)-  
diphenylketone  
12



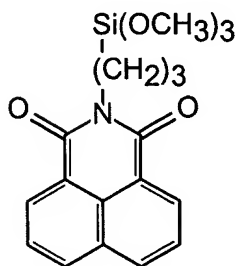
2-hydroxy-4-(3-tripropoxysilylpropoxy)-  
diphenylketone  
13



rosolic acid  
14



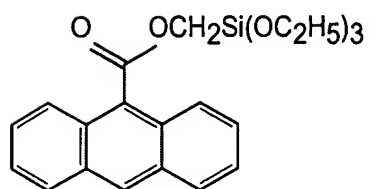
triethoxysilylpropyl-1,8-naphthalimide  
15



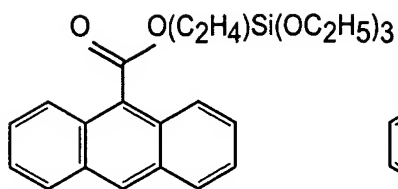
trimethoxysilylpropyl-1,8-naphthalimide  
16



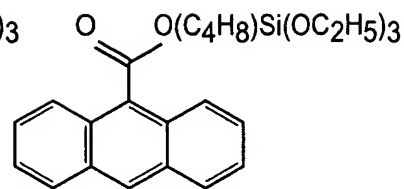
tripropoxysilylpropyl-1,8-naphthalimide  
17

**FIG. 1C**

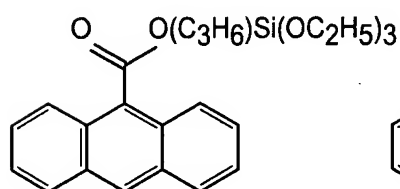
9-anthracene carboxy-methyl  
triethoxysilane (TESAC)  
18



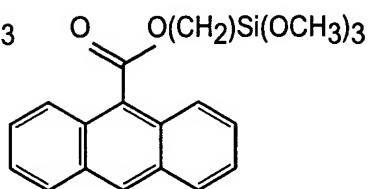
9-anthracene carboxy-ethyl  
triethoxysilane  
19



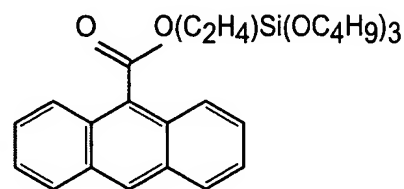
9-anthracene carboxy-butyl  
triethoxysilane  
20



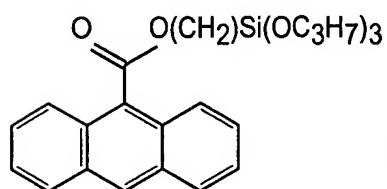
9-anthracene carboxy-propyl  
triethoxysilane (TESAC)  
21



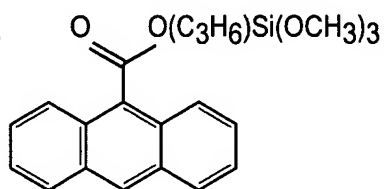
9-anthracene carboxy-methyl  
trimethoxysilane  
22



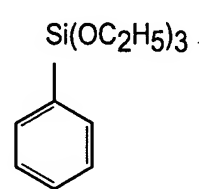
9-anthracene carboxy-ethyl  
tributoxysilane  
23



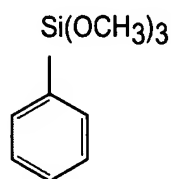
9-anthracene carboxy-methyl  
tripropoxysilane  
24



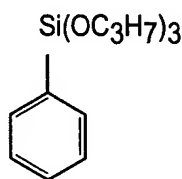
9-anthracene carboxy-methyl  
trimethoxysilane  
25



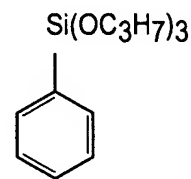
phenyltriethoxysilane  
26



phenyltrimethoxysilane  
27

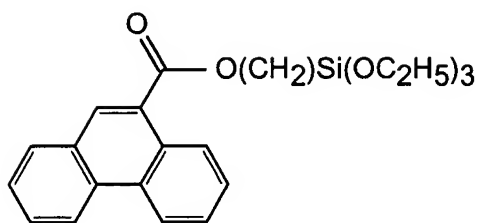


phenyltripropoxysilane  
28

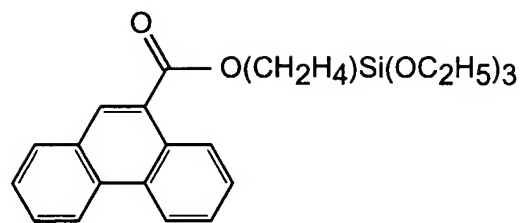


phenyltriethoxysilane  
29

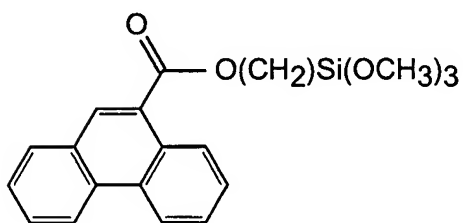
## FIG. 1D



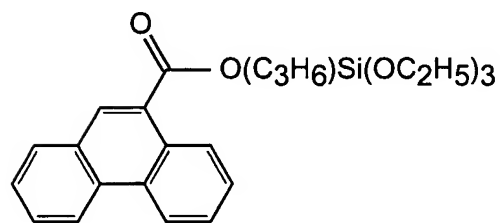
10-phenanthrene carboxy-methyl  
triethoxysilane  
29



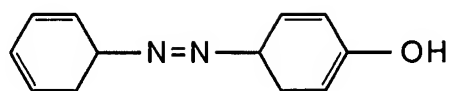
10-phenanthrene carboxy-ethyl  
triethoxysilane  
30



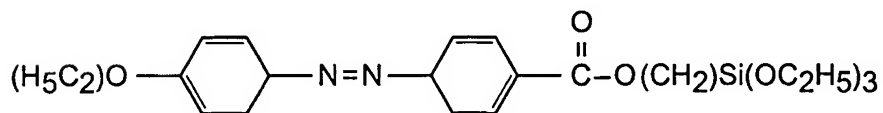
10-phenanthrene carboxy-methyl  
trimethoxysilane  
31



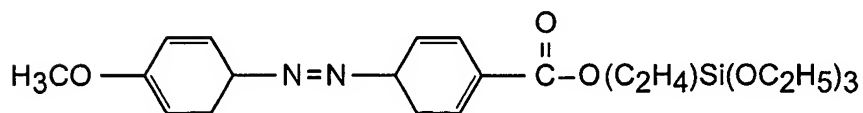
10-phenanthrene carboxy-propyl  
triethoxysilane  
32



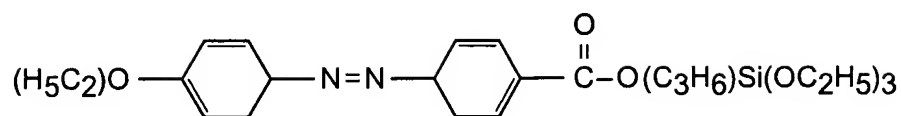
4-phenylazophenol  
33



4-ethoxyphenylazobenzene-4-carboxy  
methyl triethoxysilane  
34

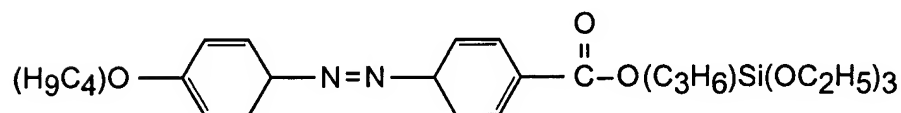


4-methoxyphenylazobenzene-4-carboxy  
ethyl triethoxysilane  
35

**FIG. 1E**

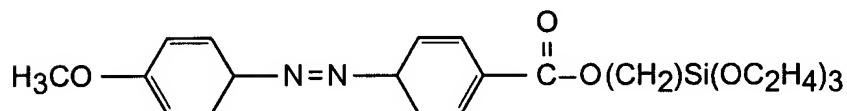
4-ethoxyphenylazobenzene-4-carboxy  
propyl triethoxysilane

36



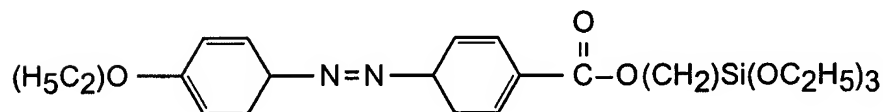
4-butoxyphenylazobenzene-4-carboxy  
propyl triethoxysilane

37



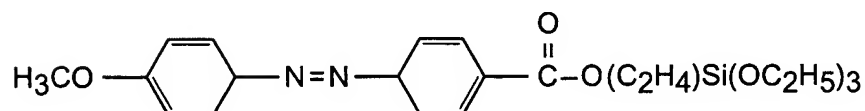
4-methoxyphenylazobenzene-4-carboxy  
methyl triethoxysilane

38



4-ethoxyphenylazobenzene-4-carboxy  
methyl triethoxysilane

39



4-methoxyphenylazobenzene-4-carboxy  
ethyl triethoxysilane

40

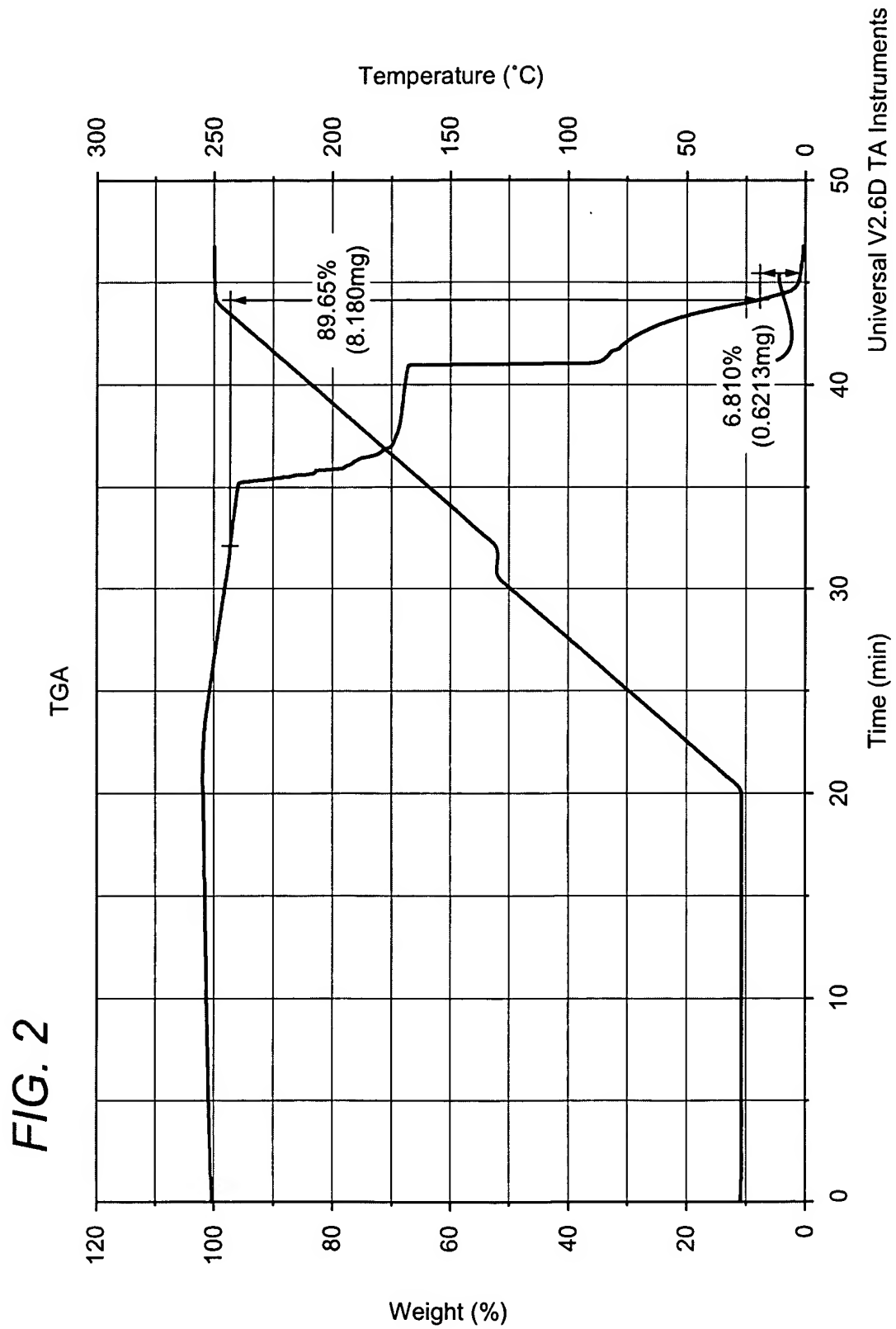
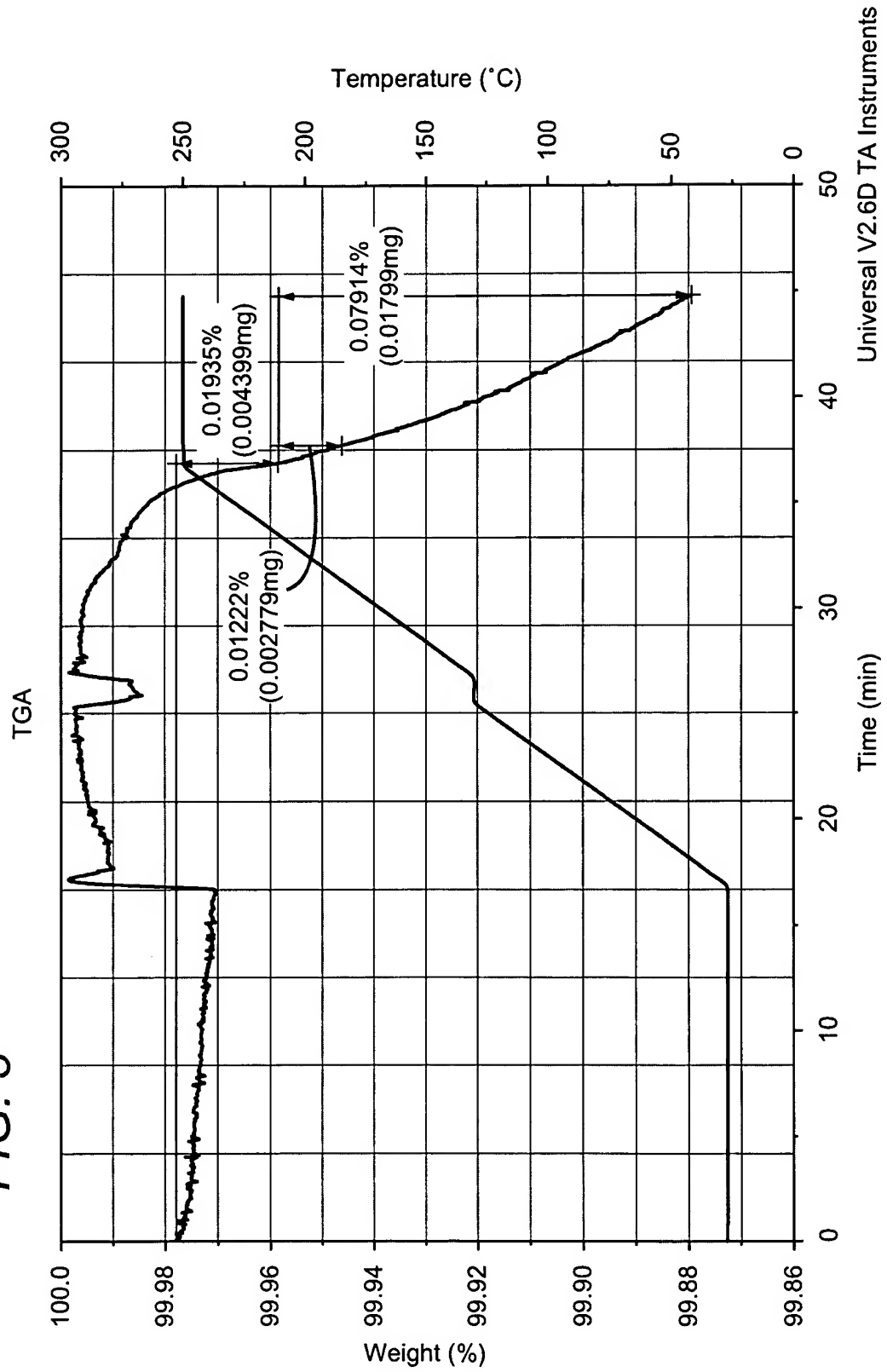
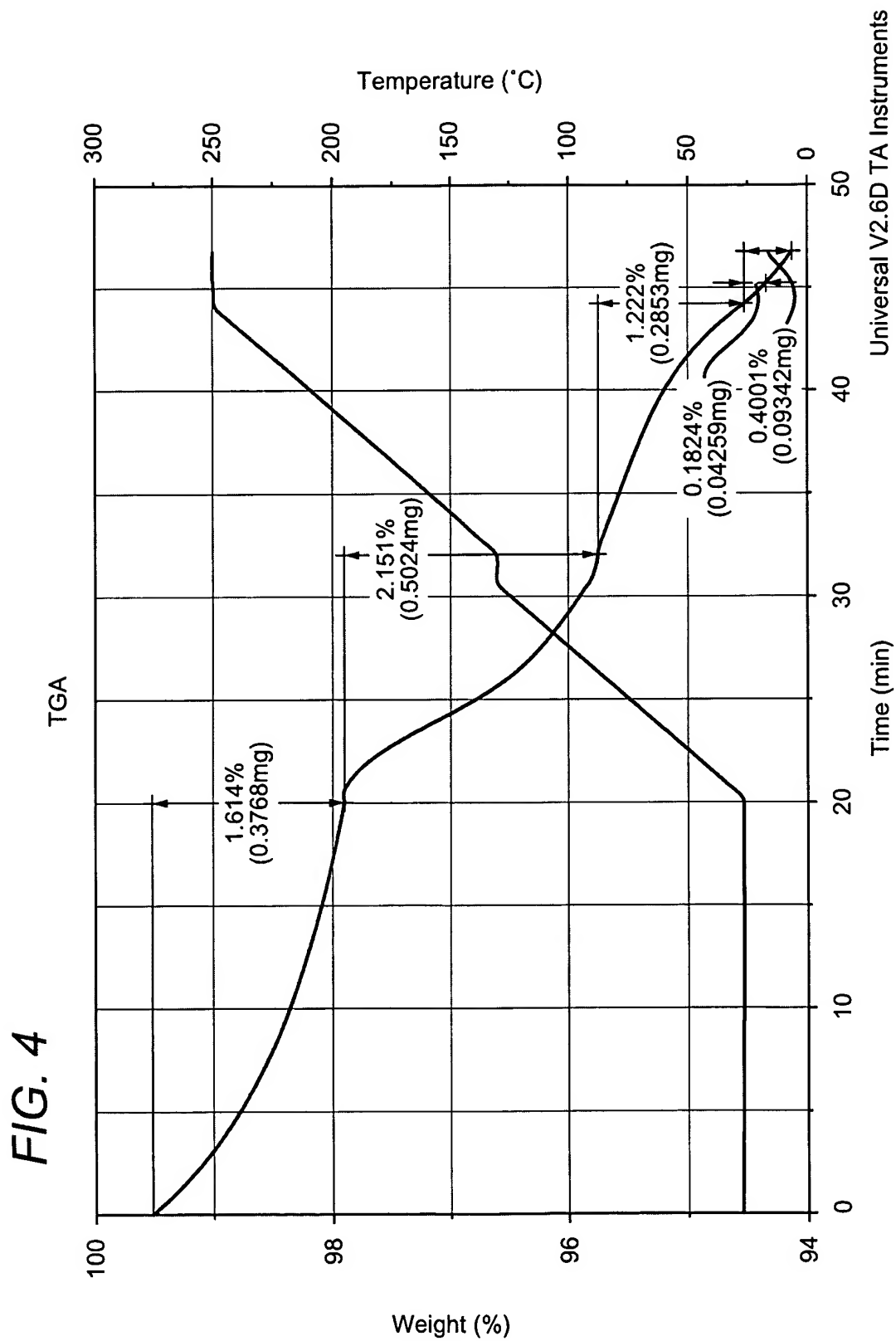


FIG. 3







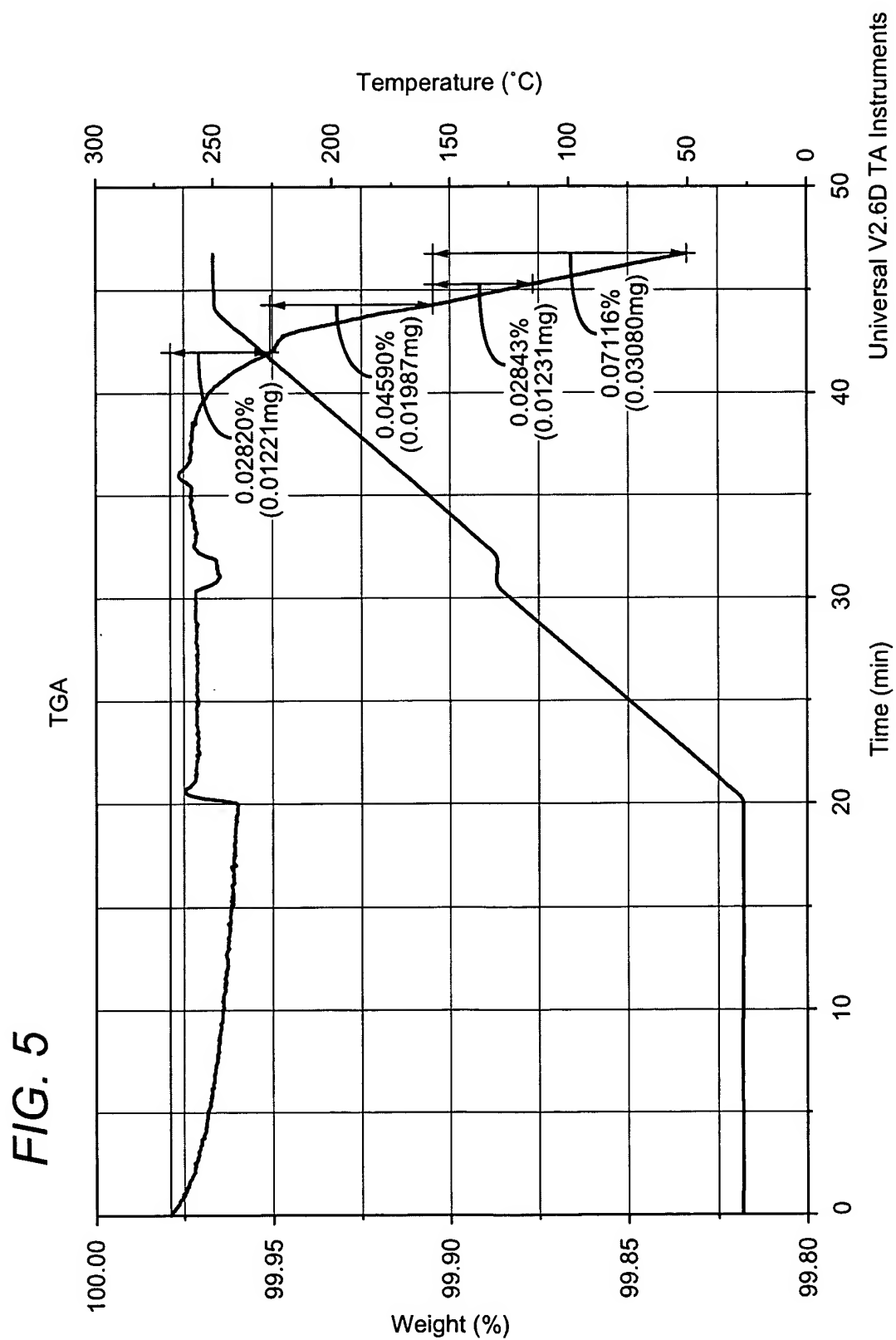
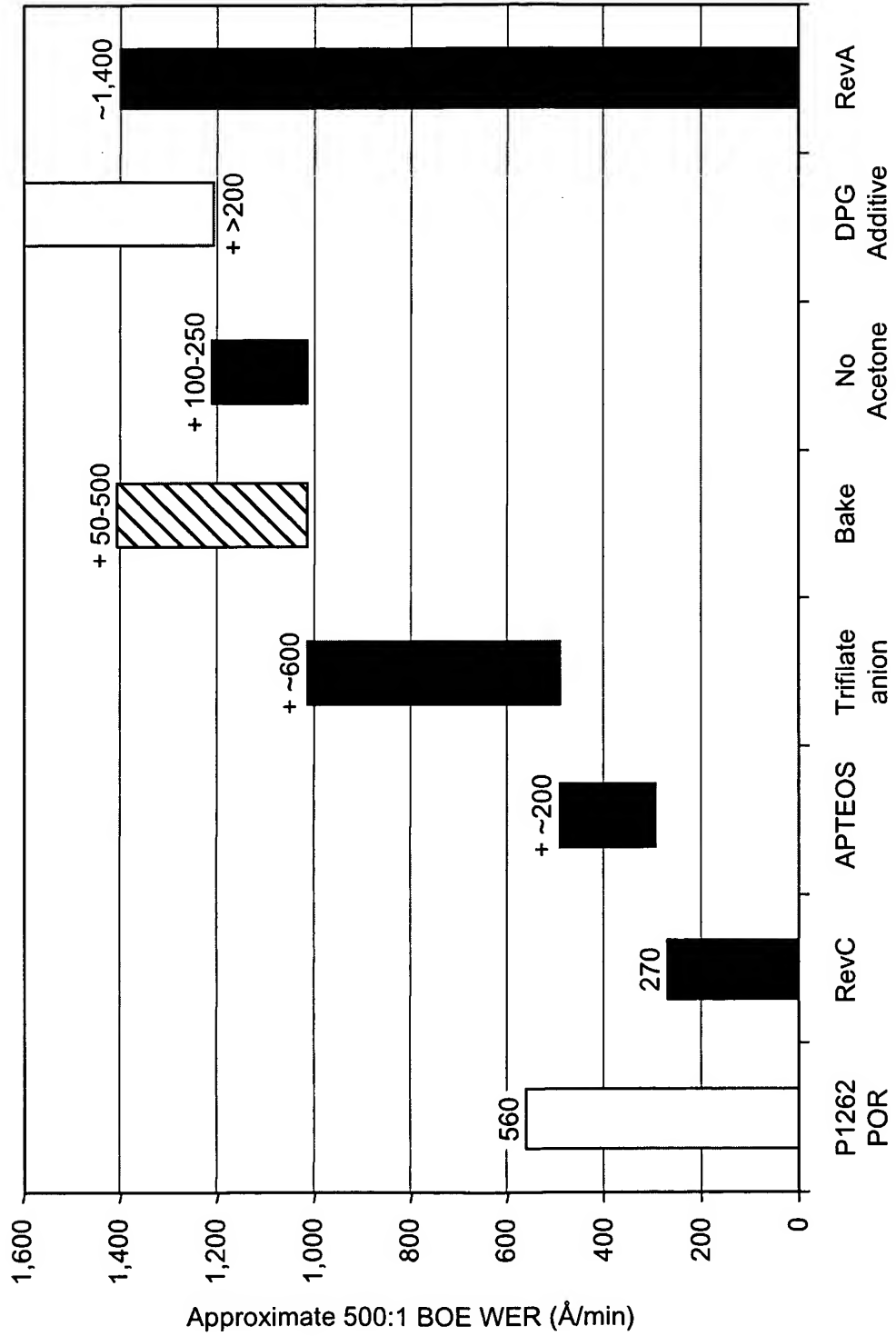


FIG. 6



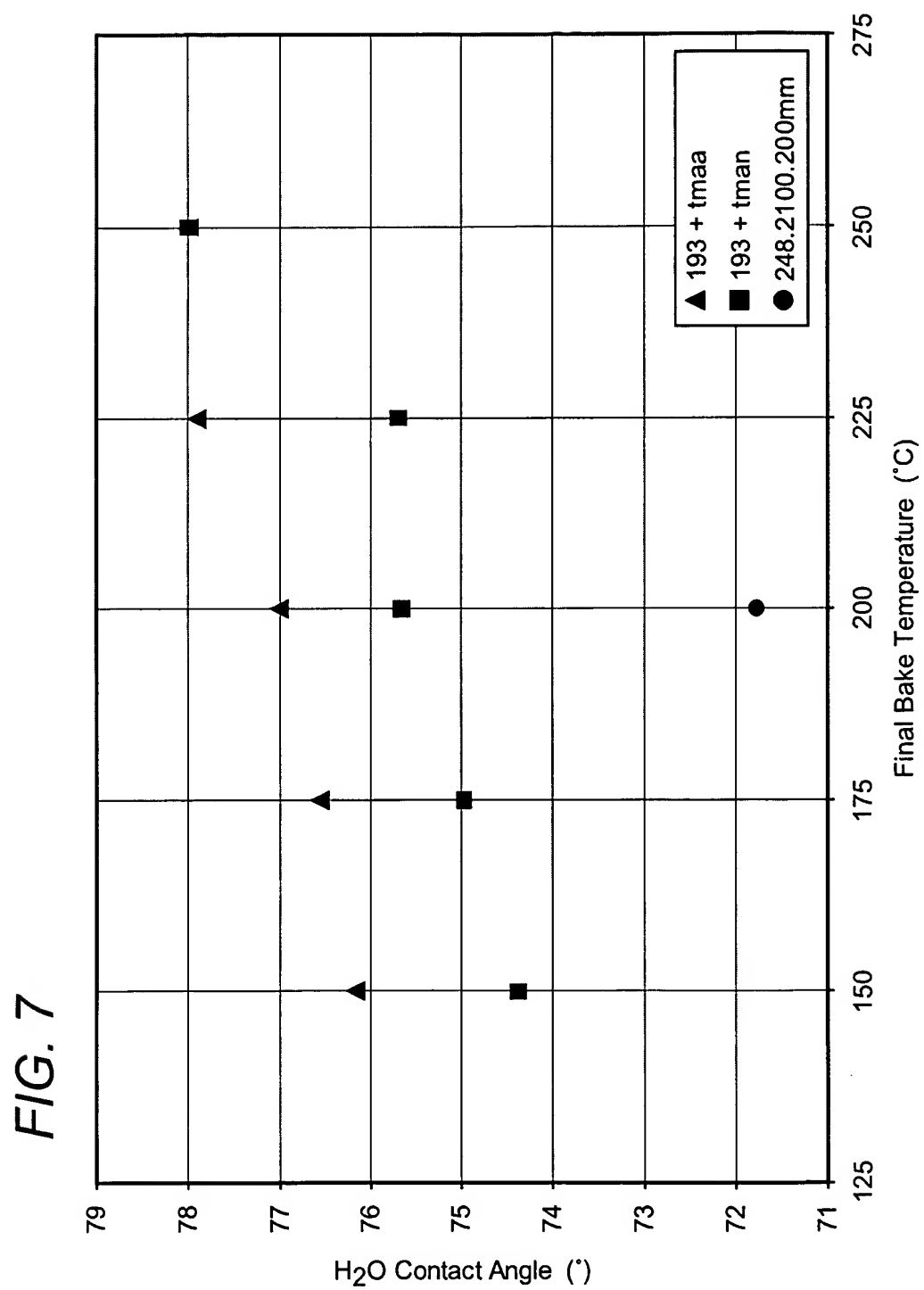
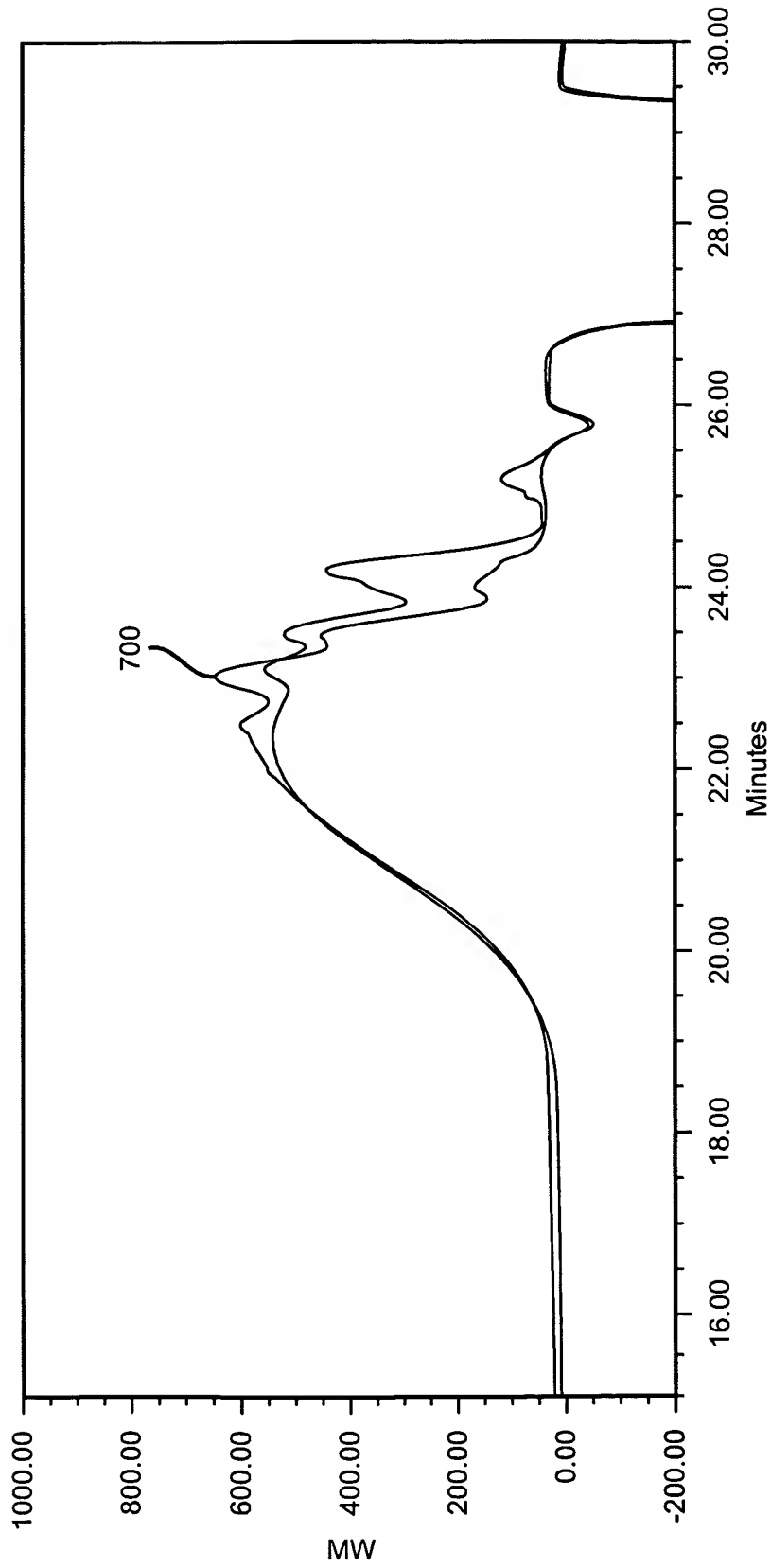
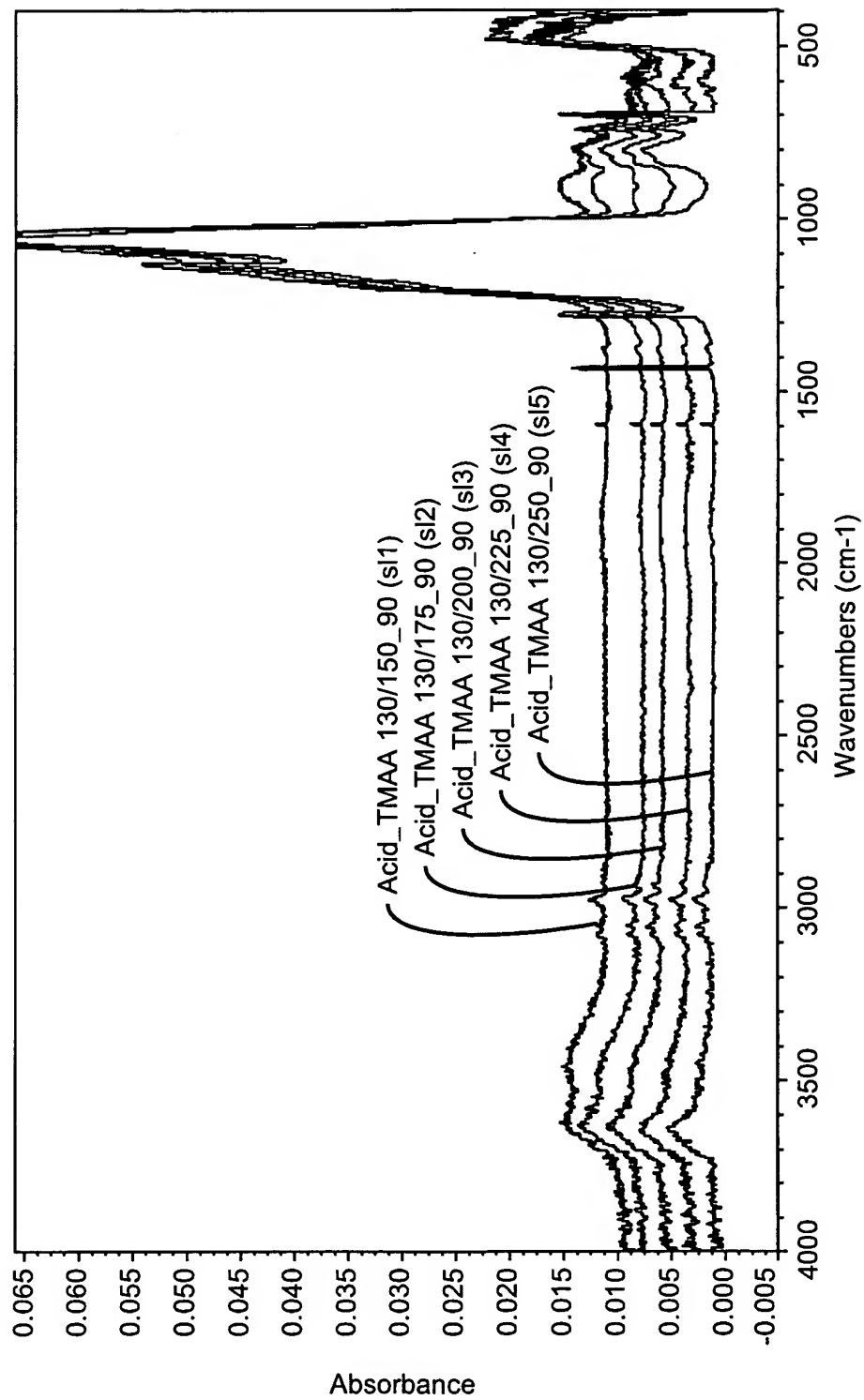


FIG. 8



Product	Mn	Mw	Mp	Mz	Mz+1	Polydispersity
193 + 600ppm Acidified TMAA	865	1183	737	1590	2012	1.367
w/ TMAA (after 5 days @ 40 C)	1021	1316	766	1671	2032	1.289
193 + 600ppm TMAN	789	1151	727	1582	1999	1.458
w/ TMAN (after 5 days @ 40 C)	848	1244	731	1706	2139	1.467

FIG. 9



- Although water clearly present at 130/150 C bake, the WER is still quite low. SiOH is clearly present at 925 cm<sup>-1</sup>:

FIG. 10

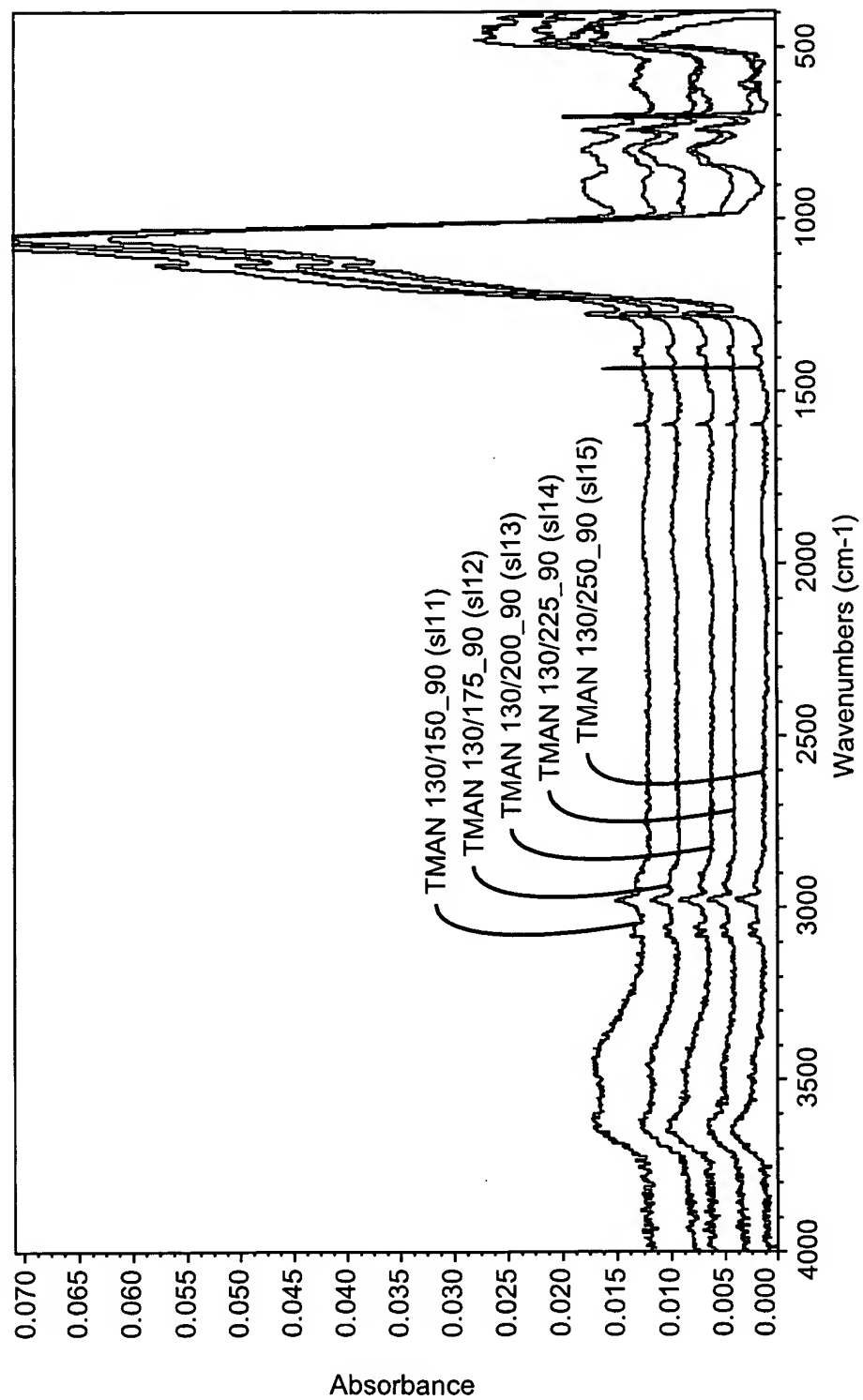


FIG. 11

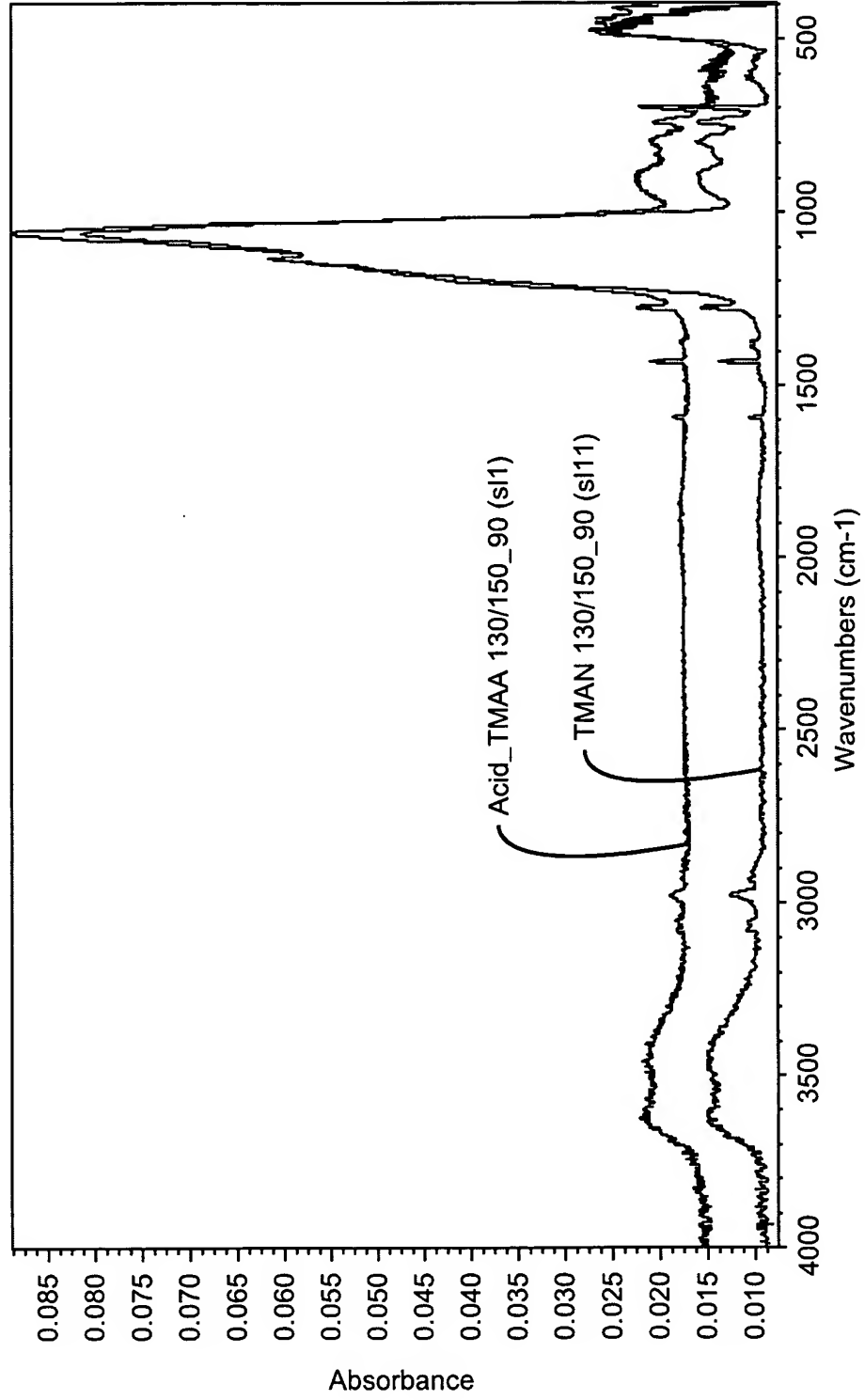


FIG. 12

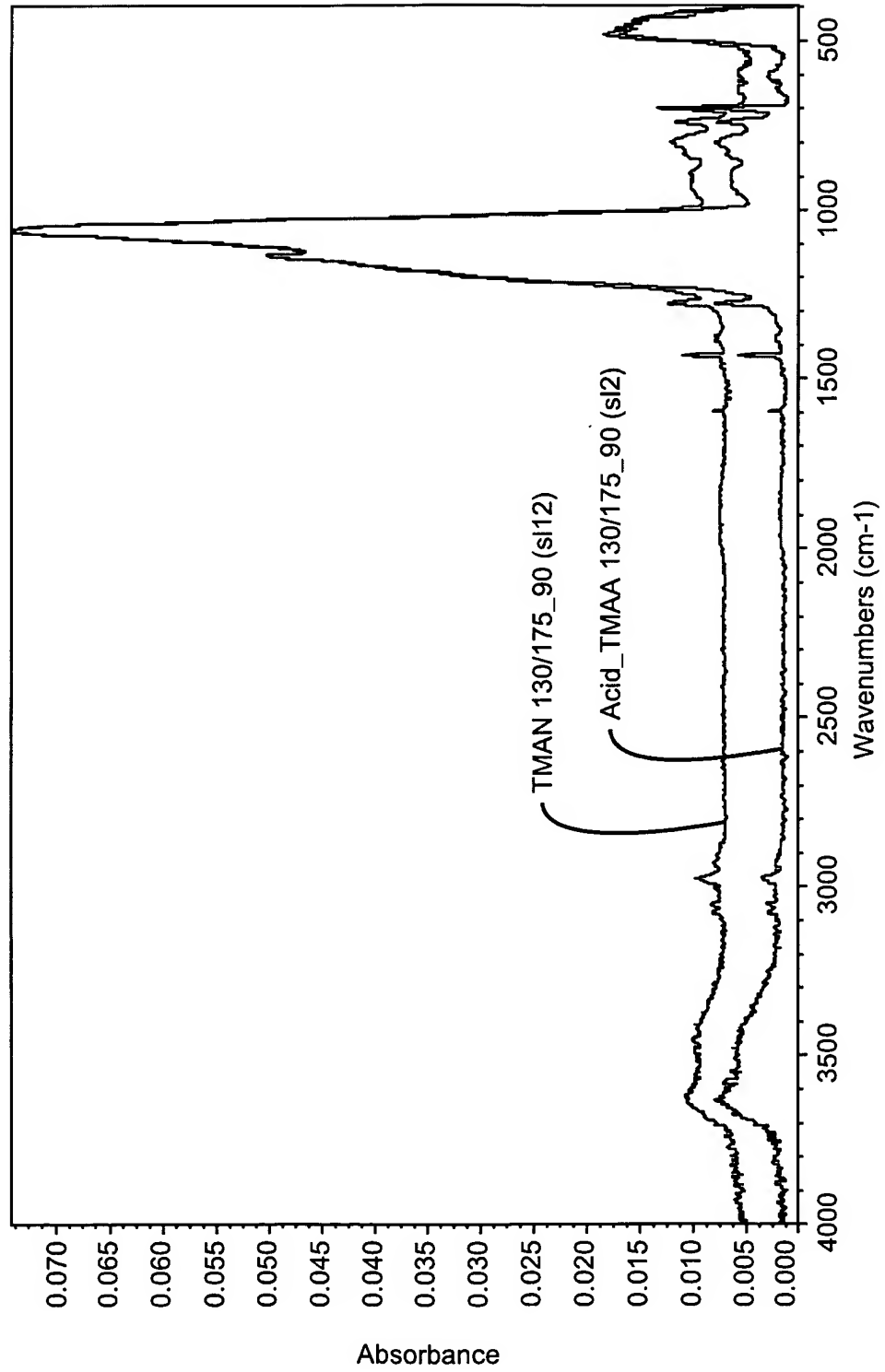




FIG. 13

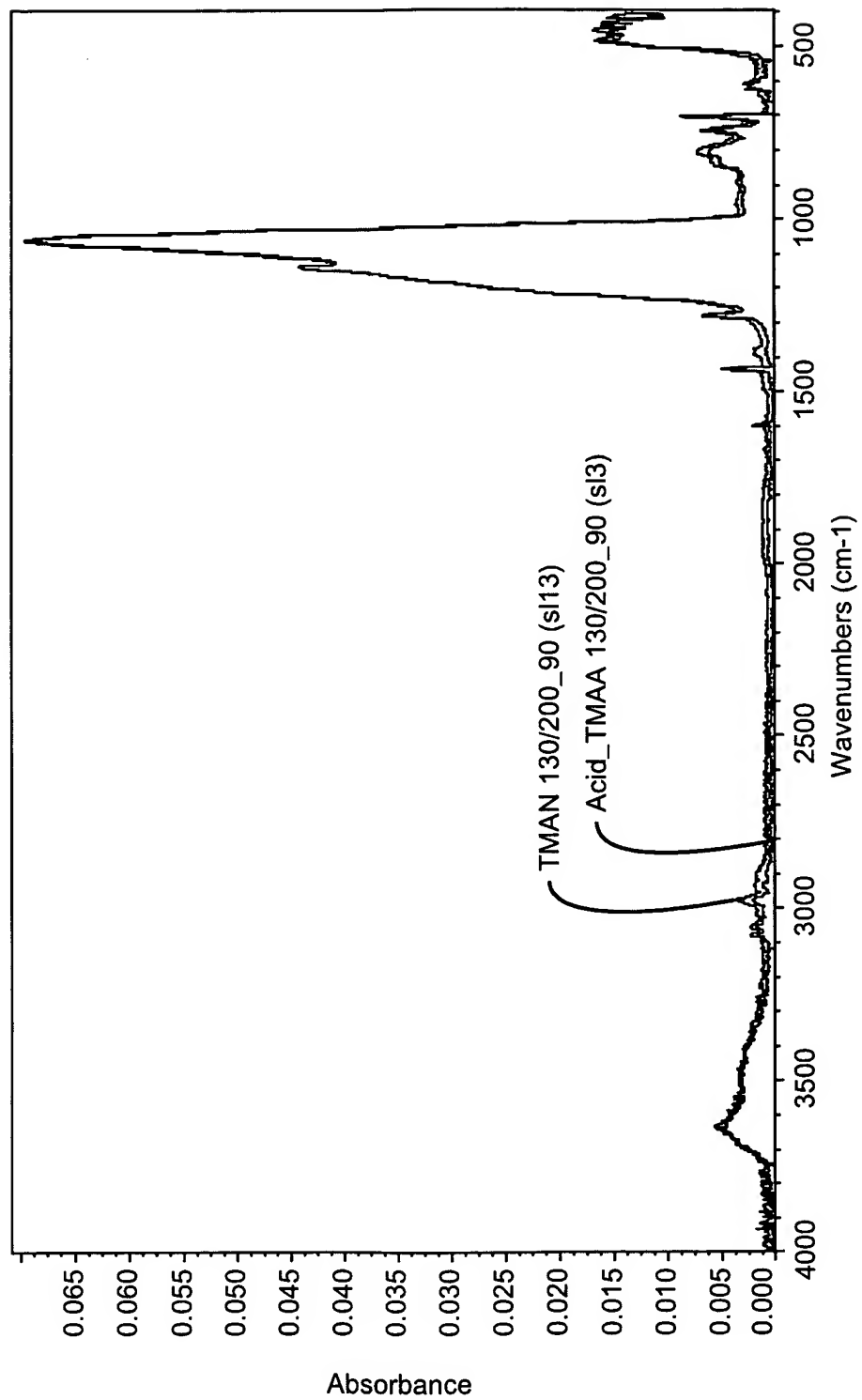


FIG. 14

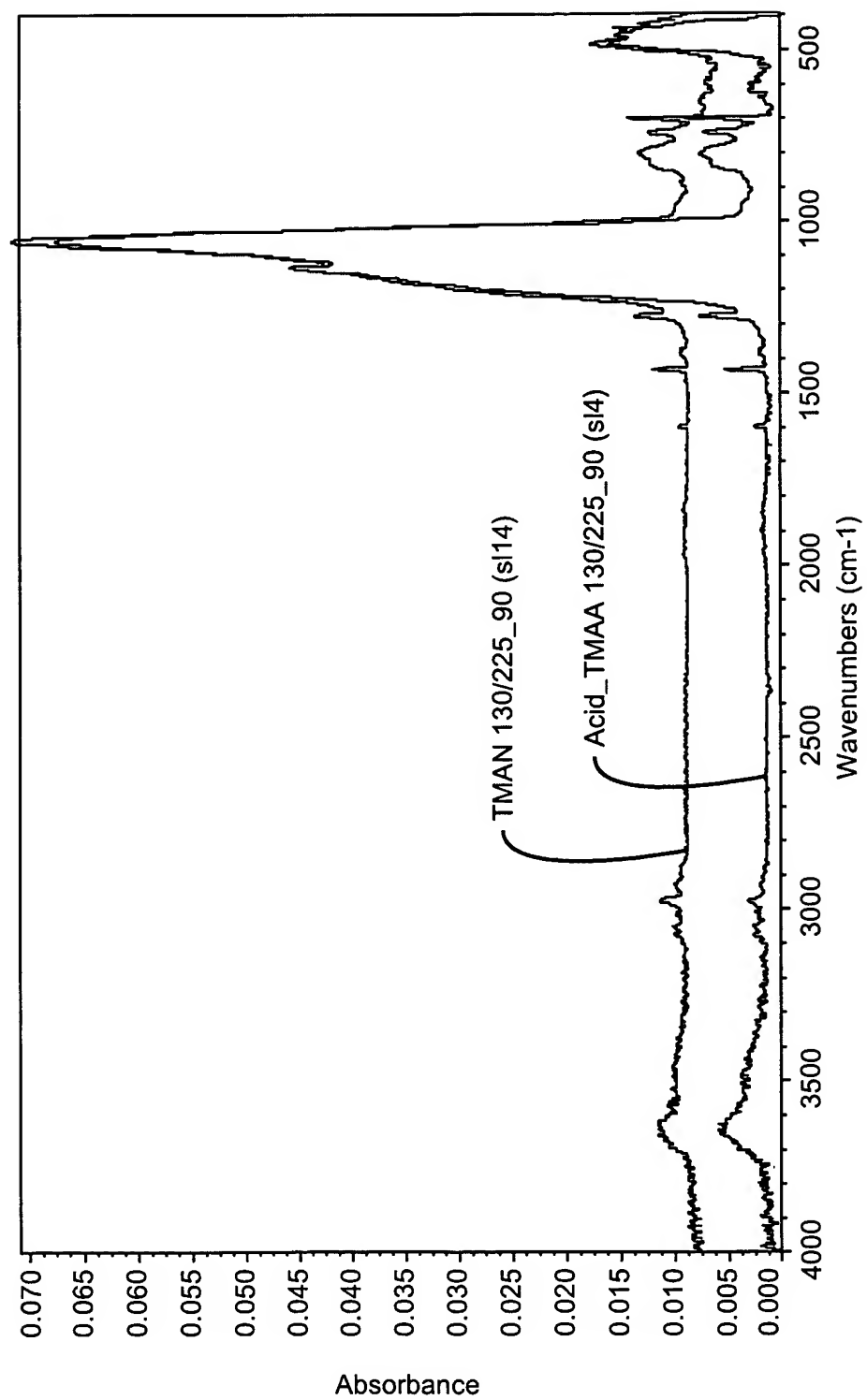


FIG. 15

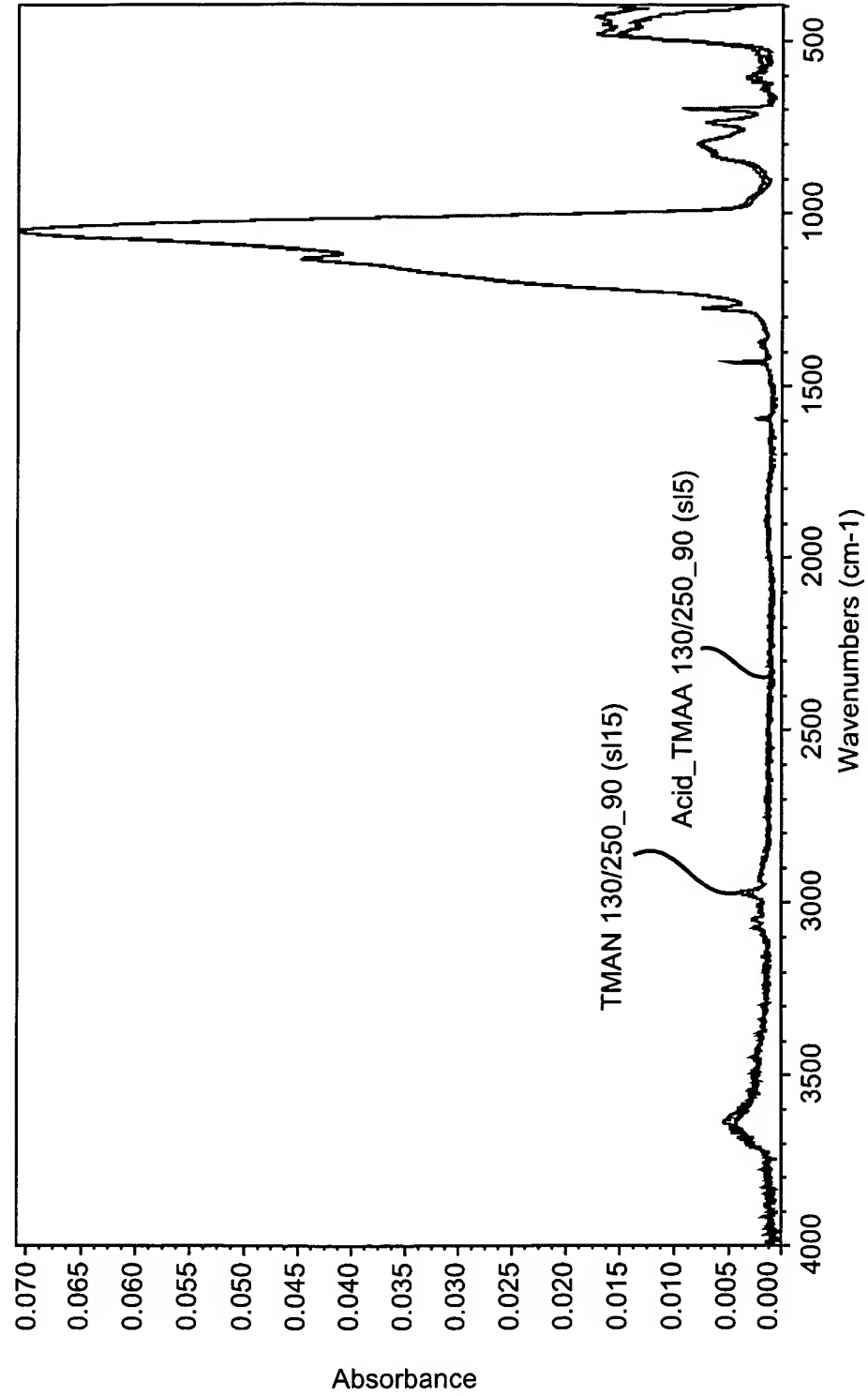


FIG. 16

193 Absorb. Composition Stabilized TMAA -vs- TMAN: Mw -vs- Aging

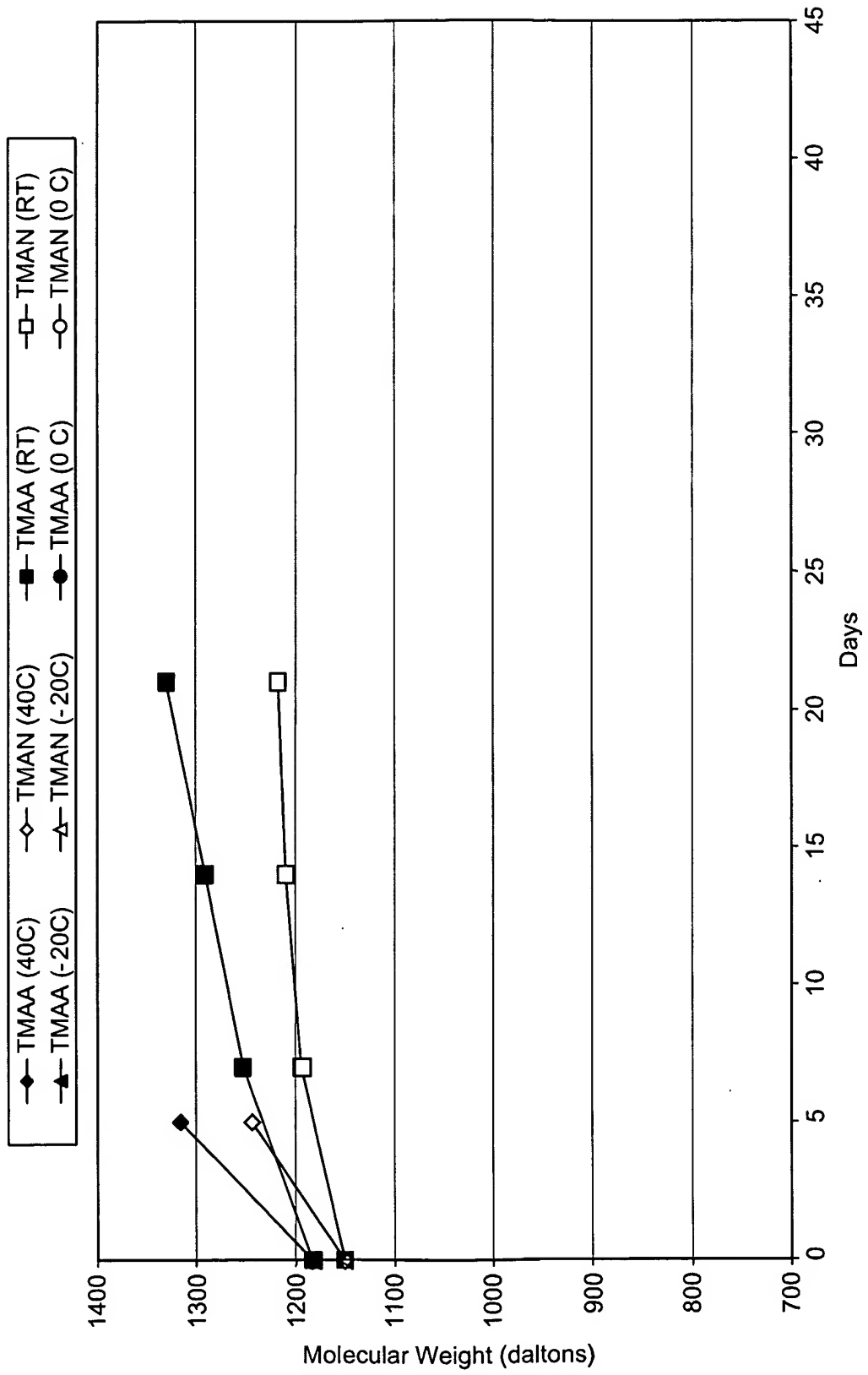
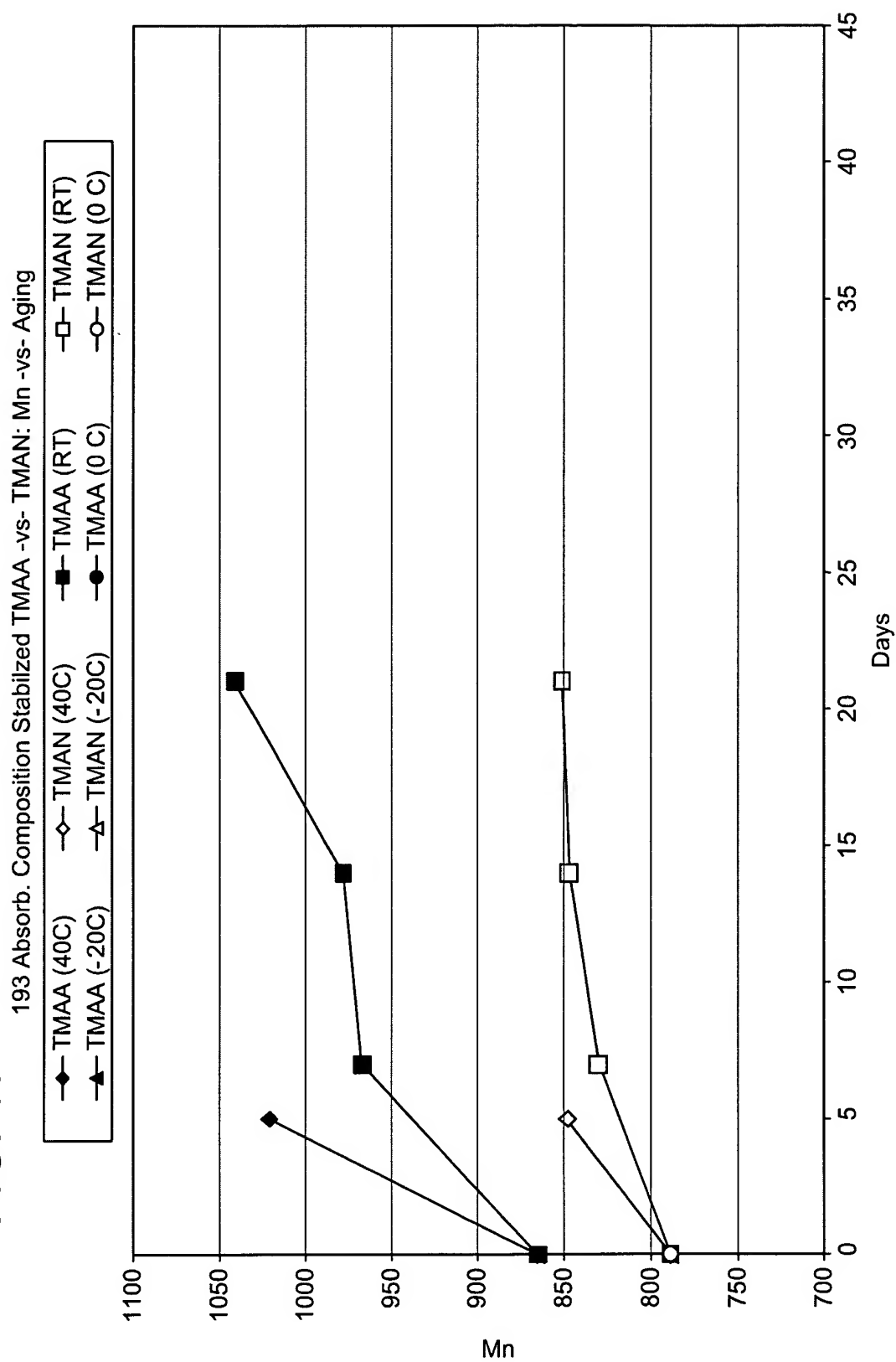
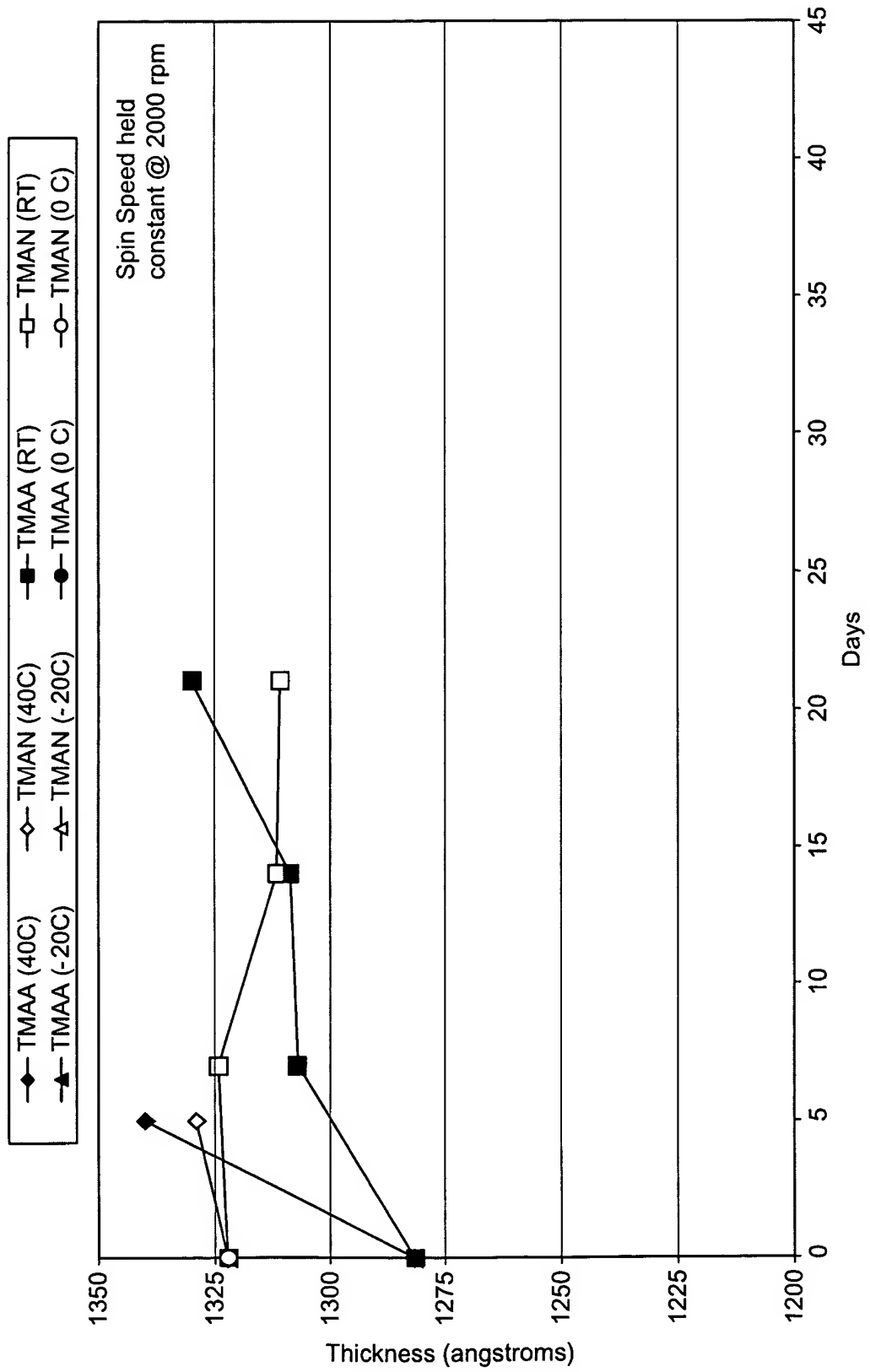


FIG. 17



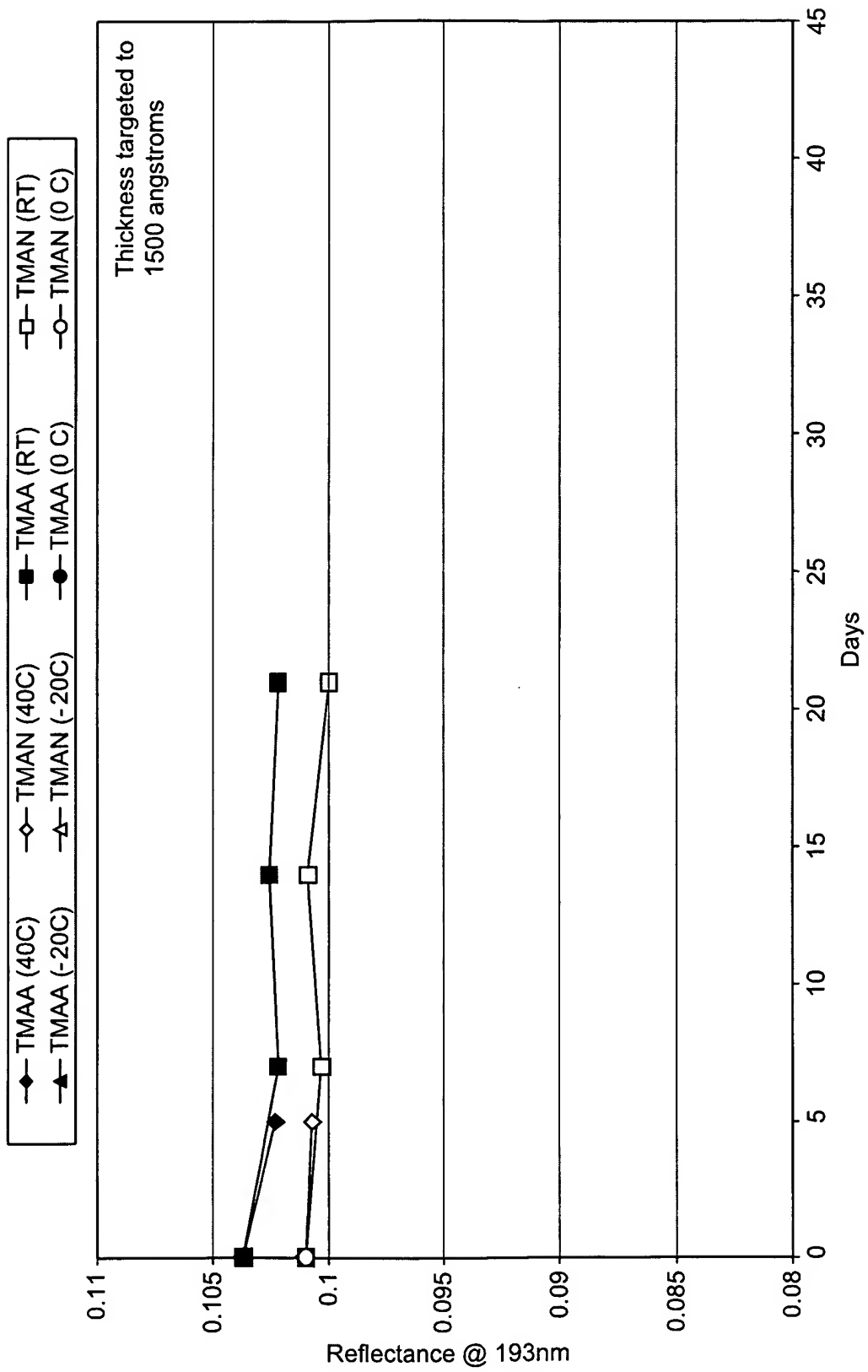
**FIG. 18**

<sup>193</sup> Absorb. Composition Stabilized TMAA -vs- TMAN: Film Thickness -vs- Aging



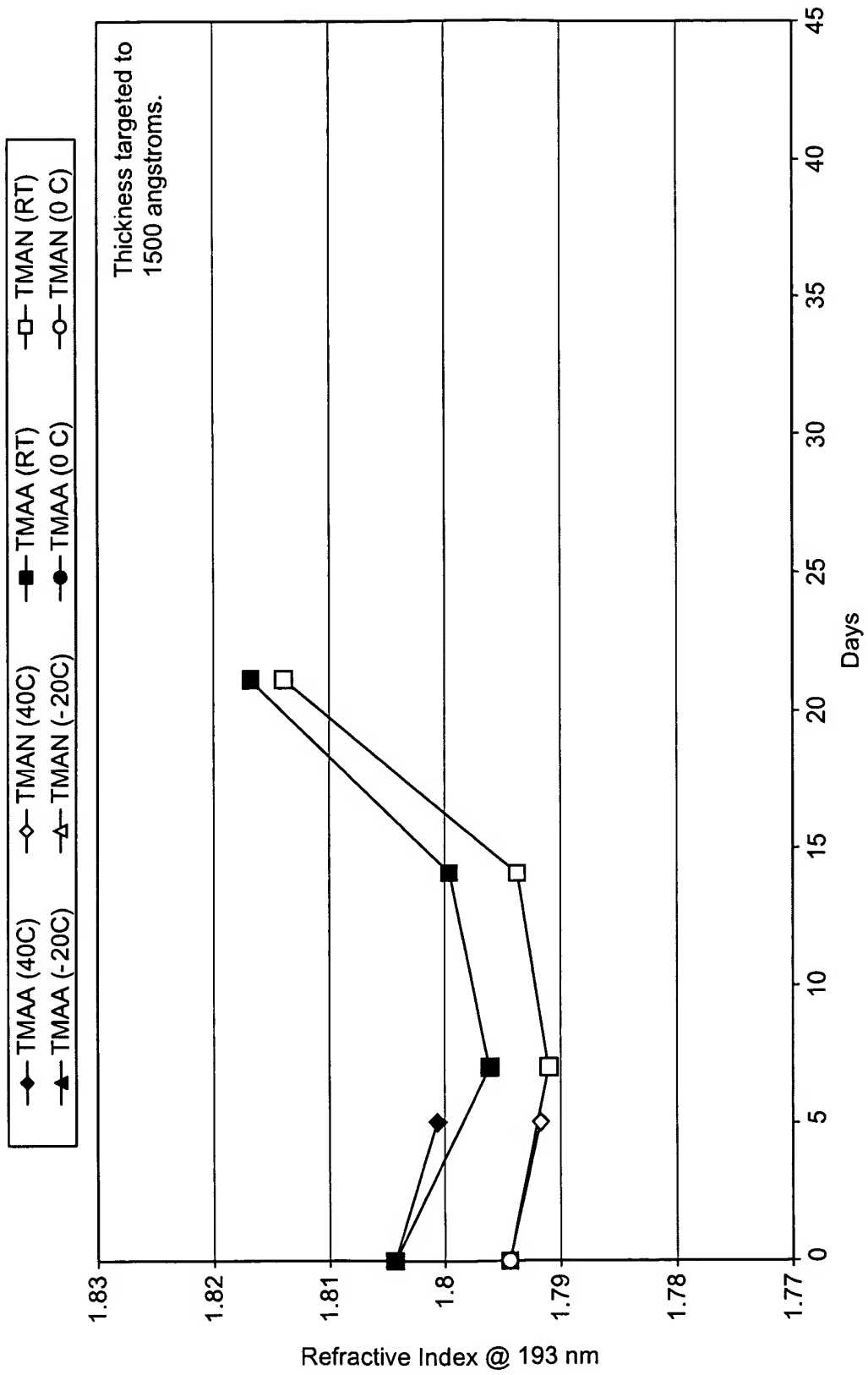
**FIG. 19**

193 Absorb. Composition Stabilized TMAA -vs- TMAN: Reflectance @ 193nm -vs- Aging



**FIG. 20**

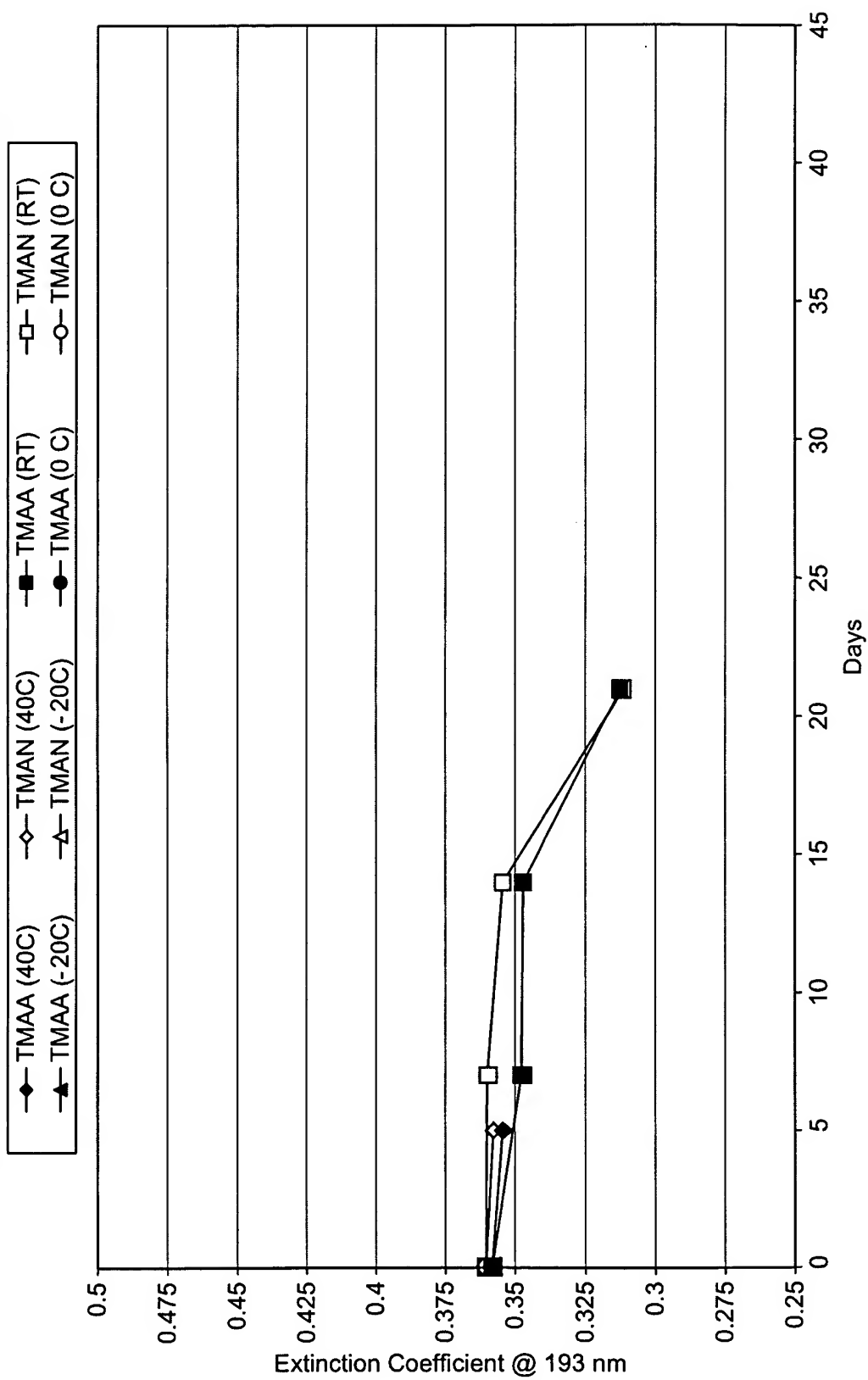
193 Absorb. Composition Stabilized TMAA -vs- TMAN: Refractive Index @ 193nm -vs- Aging





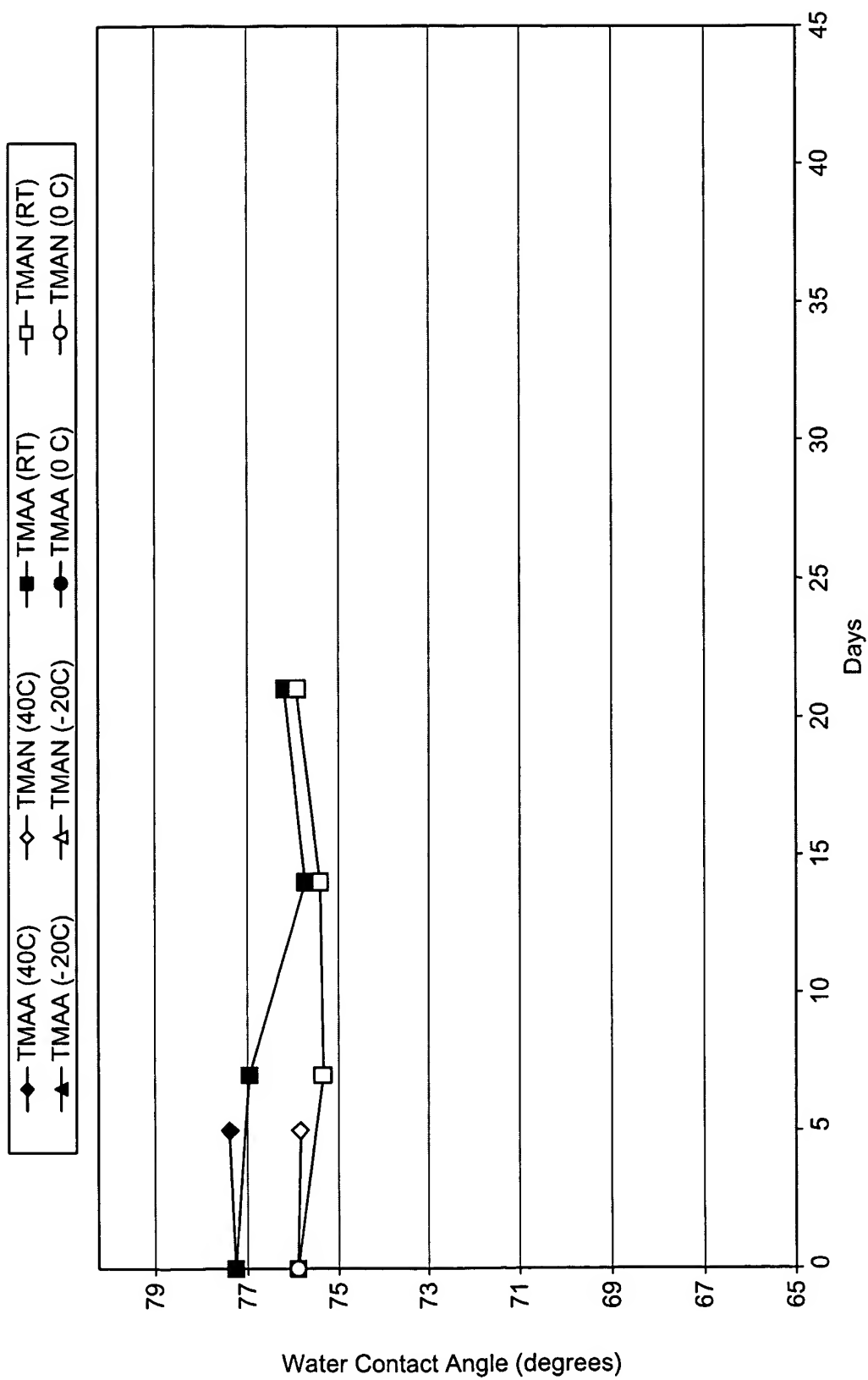
**FIG. 21**

193 Absorb. Composition Stabilized TMAA -vs- TMAN: Extinction Coefficient @ 193nm -vs- Aging



**FIG. 22**

193 Absorb. Composition Stabilized TMAA -vs- TMAN: Water Contact Angle -vs- Aging



**FIG. 23**

<sup>193</sup> Absorb. Composition Stabilized TMAA -vs- TMAN: Ethylene Glycol Contact Angle -vs- Aging

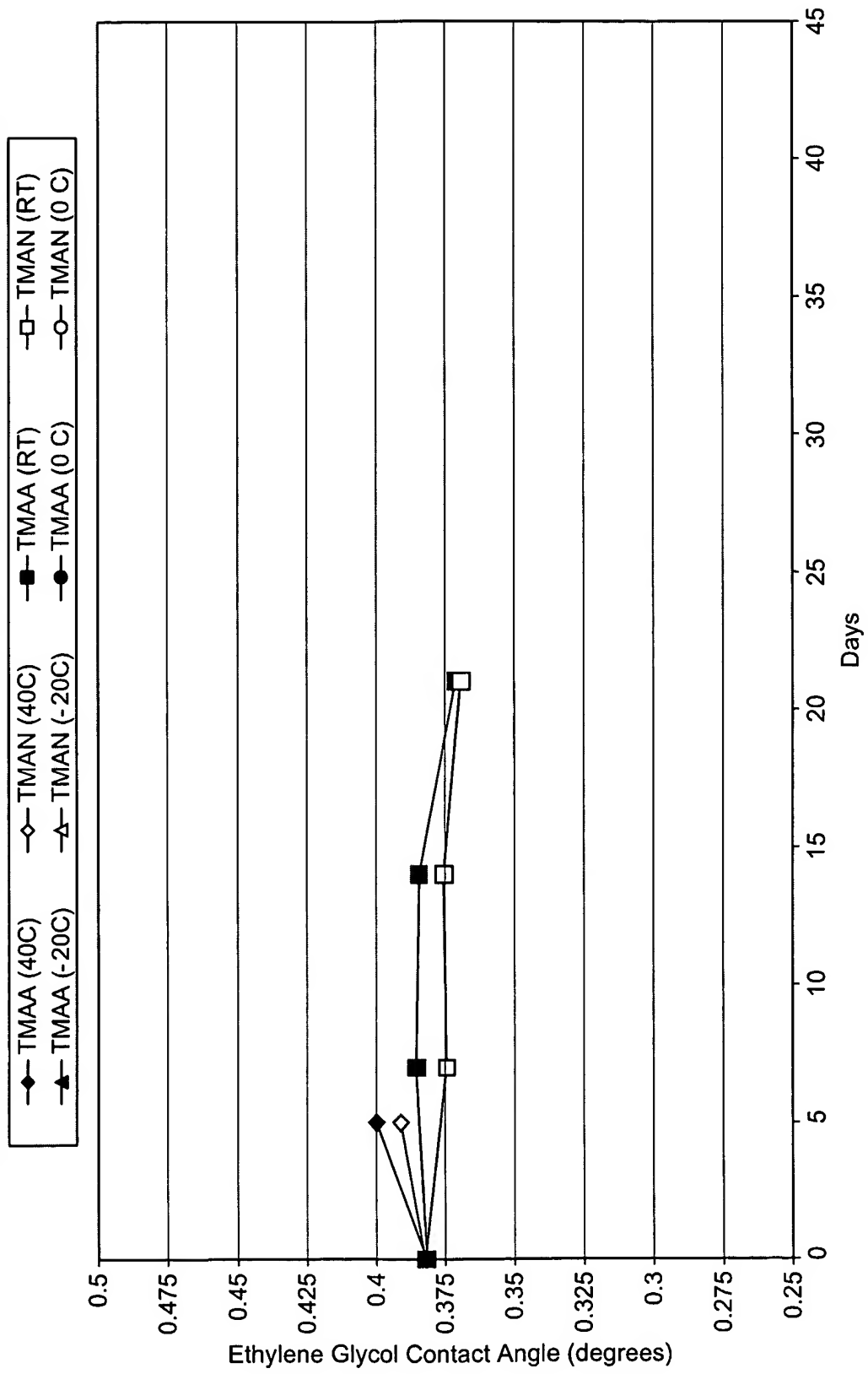


FIG. 24

193 Absorb. Composition Stabilized TMAA -vs- TMAN: TMAH Resistance -vs- Aging

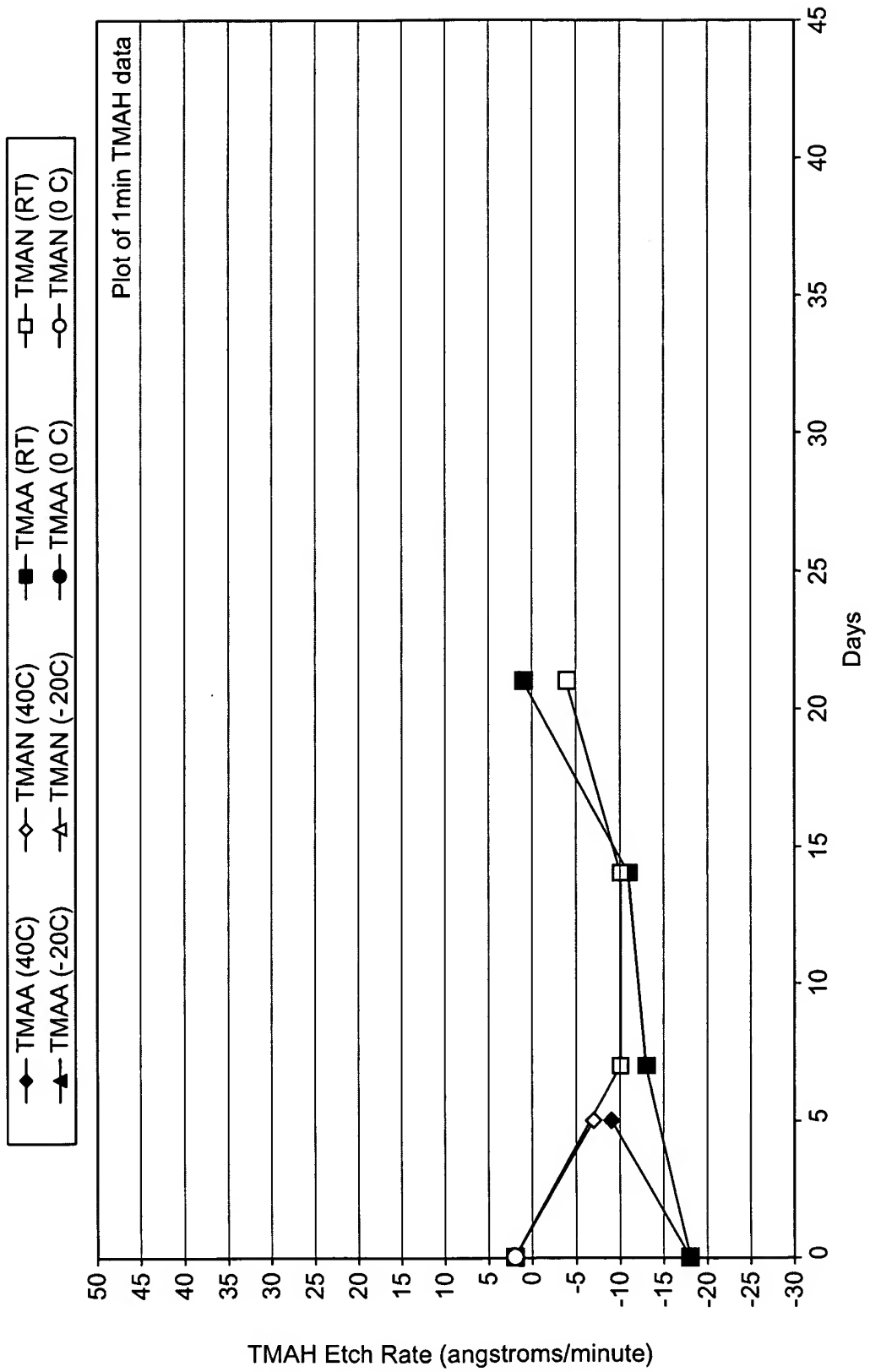


FIG. 25

193 Absorb. Composition Stabilized TMAA -vs- TMAN: 500:1 BOE strip rate -vs- Aging

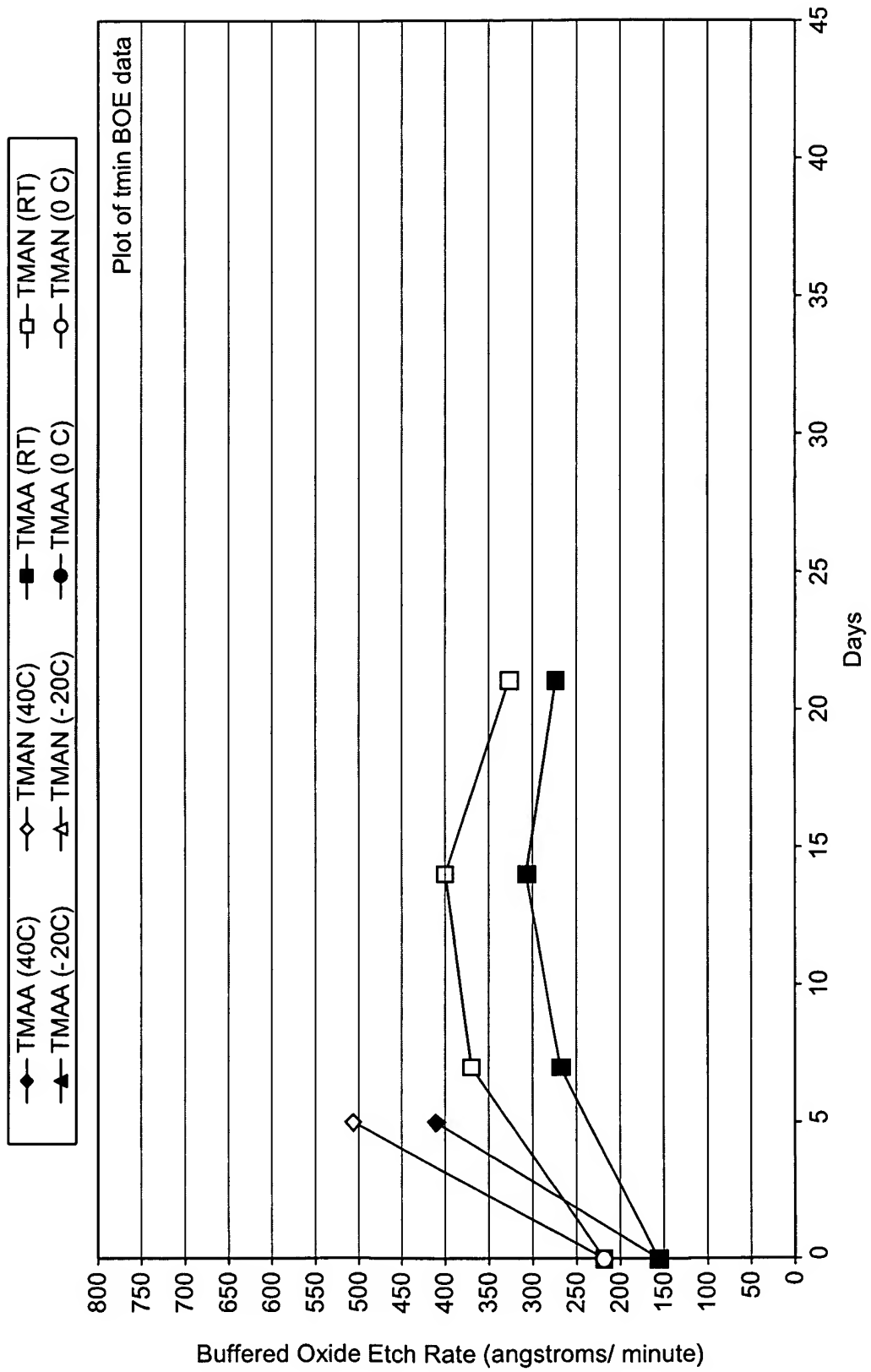


FIG. 26

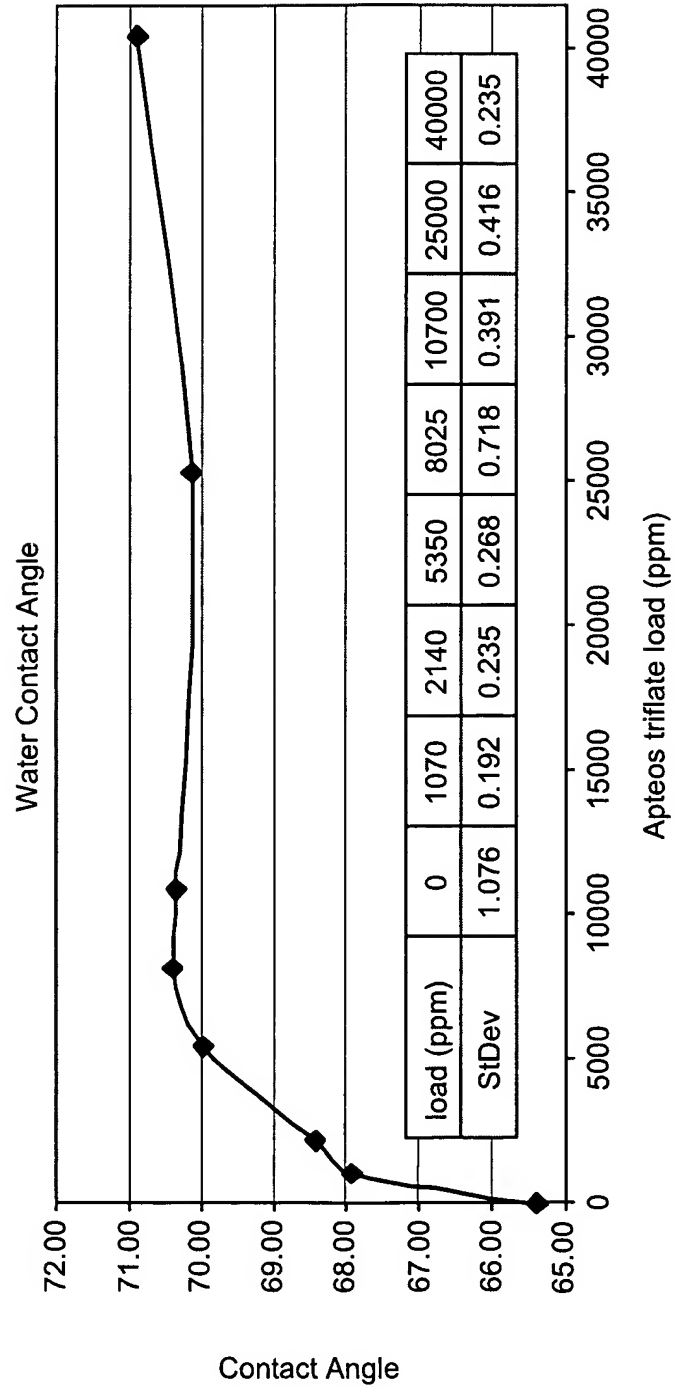
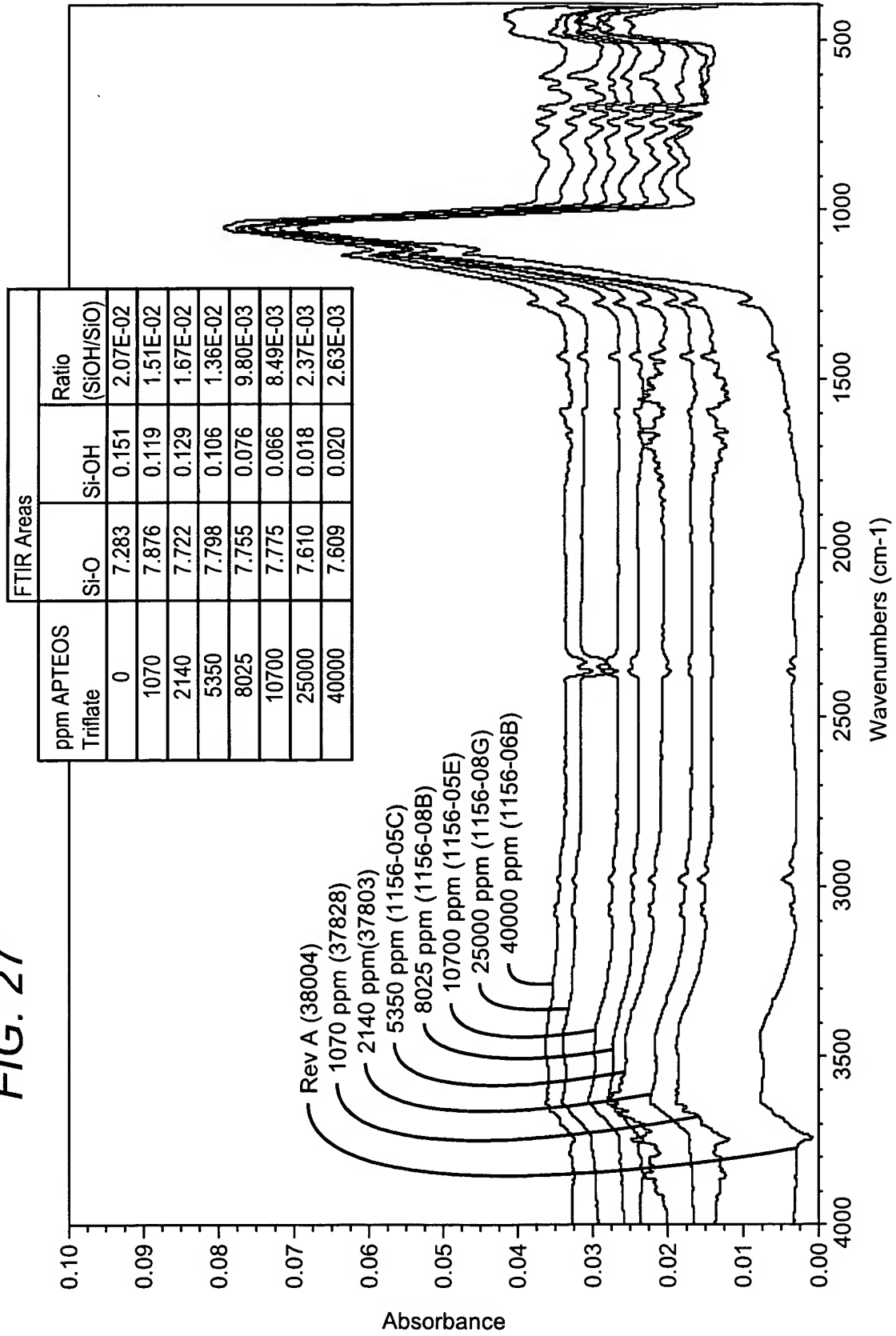


FIG. 27



## Table 3

Description		248	193	193	193	193	193	193	193	193	193	193	193	193	193	193					
		Absorbing Comp.	Absorbing Comp. POR	Absorbing Comp. Rev A	Absorbing Comp. Rev C	Absorbing Comp. Rev C	Absorbing Comp. Rev C	Absorbing Comp. Rev C (no acetone) + 5% DPG	Absorbing Comp. + 383ppm TMAH triflate	Absorbing Comp. + 383ppm TMAH triflate	Absorbing Comp. + 383ppm TMAH triflate	Absorbing Comp. + 1070ppm APTEOS triflate	Absorbing Comp. + 383ppm TMAH triflate	Absorbing Comp. + 383ppm TMAH triflate	Absorbing Comp. + 383ppm TMAH triflate	Absorbing Comp. + 383ppm TMAH triflate	Absorbing Comp. + 383ppm TMAH triflate				
Bake Sequence		130/200°C	150/250°C	130/200°C	130/200°C	130/240°C	130/200°C	130/200°C	130/200°C	130/200°C	130/200°C	130/240°C	130/240°C	130/240°C	130/240°C	130/240°C					
		50 sec each			90 sec each																
500:1BOE @21° C	30 sec	1224																			
	1 min	1000		560																	
	2 min	[880]																			
TMAH	1 min @	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre					
2.3% aq. TMAH	23° C	3529	50	2731	5	2694	57	2691	-12	2695	-7	2312	-12	2670	22	2676	8	2699	9	3543	44
	50° C	3534	429	2715	2	2663	100	2686	-19	2701	0	2331	6	2693	11	2663	-5	2705	-14	3516	>3516
	75° C	3596	1795	2720	117	2702	781	2720	36	2672	13	2323	71	2694	88	2677	71	2692	143	3588	>3588
5.0% aq. TMAH	23° C	3526	[398]	2705	-13	2679	43	2739	-1	2693	-15	2311	-8	2702	28	2716	14	2698	39	3563	129
	50° C	3487	2102	2774	3	2723	298	2702	-10	2672	-28	2327	-11	2688	40	2673	26	2752	93	3519	>3519
	75° C	3530	>3530	2709	226	2699	1212	2709	53	2725	21	2361	120	2686	211	2673	130	2685	202	3503	>3503
10.0% aq. TMAH	23° C	3497	>3497	2670	-2	2687	166	2702	-18	2670	-31	2318	-8	2691	26	2672	9	2700	45	3469	1240
	50° C	3525	>3525	2670	78	2670	716	2693	-12	2679	40	2327	11	2693	156	2666	91	2576	100	3483	>3483
	75° C	3519	>3519	2670	557	2706	>2706	2709	102	2688	364	2316	275	2731	410	2653	285	3543	1443	3532	>3532



Table 4

Description	248 Absorbing Comp.		193 Absorbing Comp. Rev C		193 Absorbing Comp. +1070ppm APTEOS triflate		193 Absorbing Comp. +1070ppm APTEOS triflate		193 Absorbing Comp. +1070ppm APTEOS triflate		193 Absorbing Comp. +1070ppm APTEOS triflate + 1.5% DPG		
	N/A		<1		<1		<1		<1		<1		
	130/200°C		130/160°C		130/160°C		130/200°C		130/240°C		130/200°C		
Bake Sequence		50 sec		90s									
500:1 BOE	1 min @	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER
	20° C	3533	[873]	1676	268	2741	[1098]	2724	[1071]	2737	[1026]	3211	[1532]
	1 min @	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER
	23° C	3527	75	1690	0	2720	5	2747	28	2710	29	3172	51
2.3% aq. TMAH	50° C	3524	572	1676	7	2722	-1	2729	-7	2713	-11	3199	[2093]
	75° C	3540	1565	1676	28	2743	127	2743	97	2692	61	3188	>3181
	23° C	3534	[480]	1681	8	2701	16	2722	23	2702	16	3179	[539]
5.0% aq. TMAH	50° C	3543	>3488	1676	12	2709	80	2717	58	2705	38	3183	>3183
	75° C	3527	>3527	1687	45	2715	272	2713	192	2671	150	3166	>3166
	23° C	3539	>3477	1690	11	2734	39	2741	36	2716	54	3201	[1942]
10.0% aq. TMAH	50° C	3532	>3532	1682	17	2736	259	2749	224	2731	168	3173	>3173
	75° C	3533	>3533	1674	109	2701	515	2726	518	2731	394	3186	>3186

Table 5

Description	193		193		193		193		193		193		193		
	Absorbing Comp.	+1070ppm APTEOS triflate + 1.5% DPG	Absorbing Comp.	+1070ppm APTEOS triflate + 3% DPG	Absorbing Comp.	+1070ppm APTEOS triflate + 3% DPG	Absorbing Comp.	+170ppm Ammonium triflate	Absorbing Comp.	+170ppm Ammonium triflate + 3% DPG	Absorbing Comp.	+170ppm Ammonium triflate	Absorbing Comp.	+170ppm Ammonium triflate + 3% DPG	
	<1		<1		<1		<1		<1		<1		<1		
pH	130/240°C		130/200°C		130/240°C		130/200°C		130/200°C		130/200°C		130/240°C		
Bake Sequence		90s													
500:1 BOE	1 min @	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER
	20° C	3214	[1432]	3507	[1176]	3548	[1065]	2751	[1113]	2971	[1514]	2982	[1459]	2982	[1459]
2.3% aq. TMAH	1 min @	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER
	23° C	3218	123	3523	83	3564	29	2732	19	2951	38	2972	30	2972	30
	50° C	3184	1163	3510	>3510	3529	>3529	2746	76	2997	655	2960	421	2960	421
5.0% aq. TMAH	75° C	3203	>3202	3505	>3505	3519	>3519	2736	325	2977	>2977	2992	>2854	2992	>2854
	23° C	3194	102	3533	[1125]	3519	[482]	2744	33	2972	223	2952	54	2952	54
10.0% aq. TMAH	50° C	3175	>3175	3505	>3505	3479	>3479	2725	254	2983	[2060]	2943	1407	2943	1407
	75° C	3165	>3165	3495	>3495	3487	>3487	2750	558	2973	>2973	2953	>2953	2953	>2953
	23° C	3200	[592]	3563	[3203]	3496	1748	2702	124	2979	1014	2949	455	2949	455
10.0% aq. TMAH	50° C	3176	>3176	3504	>3504	3496	>3496	2761	619	2983	>2983	2949	>2949	2949	>2949
	75° C	3187	>3187	3534	>3534	3500	>3477	2766	991	2986	>2986	2992	>2992	2992	>2992

Table 6

Description	248	193	193	193	193	193	193	193							
	Absorbing Comp.	Absorbing Comp. +1070ppm APTEOS triflate + 0.5% DPG	Absorbing Comp. +1070ppm APTEOS triflate + 1.5% DPG	Absorbing Comp. +1070ppm "optimized" APTEOS triflate	Absorbing Comp. +1070ppm "optimized" APTEOS triflate + 0.25% DPG	Absorbing Comp. +1070ppm "optimized" APTEOS triflate + 0.5% DPG	Absorbing Comp. +1070ppm "optimized" APTEOS triflate + 1% DPG	Absorbing Comp. +1070ppm "optimized" APTEOS triflate + 1.5% DPG							
		<1	<1	<2	<2	<2	<2	<2							
pH	N/A														
	130/200°C	130/200°C	130/200°C	130/200°C	130/200°C	130/200°C	130/200°C	130/200°C							
Bake Sequence	50 sec	90 sec													
	1 min @	Pre	ER	Pre	ER	Pre	ER	Pre							
500:1 BOE	20° C	3487	[977]	2869	[1409]	3177	[1601]	2879	[1512]	2902	[1602]	2907	[1607]	2947	[1850]
	1 min @	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER
2.3% aq. TMAH	23° C	3492	127	2874	18	3190	16	2854	28	2934	42	2957	55	2960	54
	50° C	3463	723	2886	94	3190	1806	2893	279	2887	447	2955	798	2958	735
	75° C	3494	1987	2875	861	3203	>3203	2864	[1519]	2885	>2979	2987	>2987	2984	>2984
5.0% aq. TMAH	23° C	3496	[812]	2893	17	3182	93	2853	55	2898	96	2927	158	3038	258
	50° C	3520	>3520	2857	356	3189	>3189	2844	739	2910	1095	2932	[1969]	2973	[2916]
	75° C	3506	>3506	2858	[1660]	3184	>3184	2850	>2771	2926	>2926	2926	>2926	3006	>3006
10.0% aq. TMAH	23° C	3499	>3499	2877	163	3187	2803	2871	715	2967	[1362]	2977	[2258]	2992	1991
	50° C	3522	>3522	2848	1196	3215	>3215	2899	>2899	2906	>2903	2942	>2942	2958	>2958
	75° C	3542	>3542	2851	>2851	3186	>3186	2885	>2885	2897	>2987	2991	>2991	2976	>2976

# Table 7

[illegible]

Table 8

Description	193		193		193		193		193		193		193		193										
	Absorbing Comp.	+2140ppm "optimized"	APTEOS	triflate +	0.25% DPG	0.16% DPG	Absorbing Comp.	+2140ppm "optimized"	APTEOS	triflate +	0.75% DPG	Absorbing Comp.	+170ppm "optimized"	Ammonium triflate +	1% DPG	Absorbing Comp.	+225ppm "optimized"	Ammonium triflate +	1% DPG	Absorbing Comp.	+340ppm "optimized"	Ammonium triflate +	1% DPG		
pH	<2		<2		<2		<2		<2		<2		<2		<2		<2		<2		<2		<2		
Bake Sequence	130/200°C		130/200°C		130/200°C		130/200°C		130/200°C		130/200°C		130/200°C		130/200°C		130/200°C		130/200°C		130/200°C		130/200°C		
	90 sec		90 sec		90 sec		90 sec		90 sec		90 sec		90 sec		90 sec		90 sec		90 sec		90 sec		90 sec		
500:1 BOE	1 min @	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER
	20° C	2970	[1527]	2933	[1486]	2933	[1313]	2696	[1130]	2902	[1272]	2938	[1314]	2970	[1396]										
2.3% aq. TMAH	1 min @	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER
	23° C	2995	78	2962	76	2905	70	2913	64	2920	77	2935	88	2949	63										
	50° C	2965	248	2947	195	2929	171	2929	211	2908	167	2932	220	2951	215										
	75° C	2970	[1608]	2946	1166	2914	1035	2959	1341	2941	1077	2962	1369	2998	1565										
5.0% aq. TMAH	23° C	2959	137	2932	103	2905	87	2924	90	2936	91	2929	133	2960	105										
	50° C	2968	591	2942	462	2915	405	2914	486	2923	412	2980	567	2991	548										
	75° C	2943	[2608]	2983	1565	2948	1398	2932	[2138]	2945	[1664]	2940	[2166]	2974	>2974										
10.0% aq. TMAH	23° C	2982	186	2937	147	2915	99	2944	124	2919	124	2962	117	2989	189										
	50° C	3012	1616	2950	1187	2934	1028	2978	1274	2909	1170	2908	1253	3008	1476										
	75° C	1966	>2966	2971	>2971	2879	[2878]	2923	2923	2932	>2932	2937	>2937	2972	>2972										

## Table 9



Description	248	193	193	193	193	193	193	193							
	Absorbing Comp.	Absorbing Comp. +1070ppm	Absorbing Comp. +1070ppm	Absorbing Comp. +1070ppm	Absorbing Comp. +1070ppm	Absorbing Comp. +1070ppm	Absorbing Comp. +1070ppm	Absorbing Comp. +1070ppm							
	"optimized"	"optimized"	"optimized"	"optimized"	"optimized"	"optimized"	"optimized"	"optimized"							
	APTEOS triflate + 0% DPG	APTEOS triflate + 0.08% DPG	APTEOS triflate + 0.16% DPG	APTEOS triflate + 0.16% DPG	APTEOS triflate + 0.25% DPG	APTEOS triflate + 0.08% DPG	APTEOS triflate + 0.16% DPG	APTEOS triflate + 0.25% DPG							
pH	<2	<2	<2	<2	<2	<2	<2	<2							
Bake Sequence	130/200°C	130/200°C	130/200°C	130/200°C	130/200°C	130/200°C	130/200°C	130/200°C							
	50 sec	90 sec			90 sec										
500:1 BOE	1 min @ 20°C	Pre 3565 [1013];	ER 2887 [1354]	ER 2900 [1356]	Pre 2942 [1467]	ER 2974 [1450];	Pre 2910 [1450]	ER 2984 [1565];							
	1 min @ 23°C	Pre 3544	ER 2866	ER 2885	Pre 2921	ER 2956	Pre 2909	ER 2944							
2.3% aq. TMAH	50°C	3561	803 ; 2858	105	2894	142	2952	175	2933	242 ; 2906	166	2984	249	2960	266
	75°C	3598 [2559];	2902	622	2925	833	2916	1191	2982	1506 ; 2885	893	2925	1089	2987	[1854];
5.0% aq. TMAH	23°C	3559	>3530; 2861	81	2901	101	2930	91	2941	100 ; 2875	79	2904	85	2966	137
	50°C	3539	>3539; 2848	256	2874	339	2902	456	2970	588 ; 2917	410	2931	487	2987	640
	75°C	3565	>3563; 2893	789	2912	1124	2941	1612	2927	[2504]; 2907	1198	2952	[1672]	2981	[2920];
10.0% aq. TMAH	23°C	3563	>2563; 2850	93	2892	132	2917	156	2956	226 ; 2865	115	2947	158	2960	222
	50°C	3580	>3580; 2892	704	2870	851	2936	1211	2977	1548 ; 2894	934	2918	1186	2950	1771
	75°C	3545	>3545; 2893	[1493]	2886	[2142]	2914	[2914]	2939	>2939; 2879	[2267]	2967	>2967	2960	>2960;

Table 10

Descriptions	193 Absorbing Comp. + 1070ppm APTEOS tosylate					193 Absorbing Comp. + 1070ppm APTEOS tosylate + 5% DPG					193 Absorbing Comp. + 1070ppm APTEOS tosylate + 5% DPG				
	pH	1.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bake temp. (C)/Time (Sec.)		150/250C -- 50sec		130/200C -- 90sec		130/240C -- 90sec		130/200C -- 90sec		130/240C -- 90sec		130/200C -- 90sec		130/240C -- 90sec	
Metrics		ER (A/min)		ER (A/min)		ER (A/min)		ER (A/min)		ER (A/min)		ER (A/min)		ER (A/min)	
2.5% TMAH @ 21°C	1 min	210	12	12	10	10	53	18	10	18	10	53	18	10	10
	2 min	167	12	12	4	4	42	10	4	10	4	42	10	10	10
500:1BOE @ 21°C	30 sec	1224	1440	1440	[880]	[880]	[2405]	[1799]	[880]	[880]	[880]	[2405]	[1799]	[1799]	[1799]
	1 min	1000	>1215	>1215	845	845	>1309	>1255	845	845	845	>1309	>1255	>1255	>1255
	2 min	[880]	>673	>673	>689	>689	>656	>652	>689	>689	>689	>656	>652	>652	>652

ER: Etch Rate (A/min);

Pre: Pre-Immersion SOG Film Average Thickness in Angstrom;

 ER > 1000A/min ER < 1000A/min

&gt; Bare Si post-etch


[ ] Post-etch film is highly non-uniformed.


*Table 11*

Descriptions		248 Absorbing Comp.	193 Absorbing Comp. Rev A + 383ppm TMAH triflate	193 Absorbing Comp. Rev A + 383ppm TMAH tosylate
pH		N/A	<1	<1
Bake temp. (C)/Time (Sec.)		130/200C -- 50sec	130/240C -- 90sec	130/240C -- 90sec
Metrics		ER (A/min)	ER (A/min)	ER (A/min)
2.5% TMAH @ 21°C	1 min	210	11	16
	2 min	167	4	8
500:1BOE @ 21°C	30 sec	1224	969	689
	1 min	1000	844	647
	2 min	880	854	665

ER: Etch Rate (A/min);

Pre: Pre-Immersion SOG Film Average Thickness in Angstrom;

 ER > 1000A/min

 ER < 1000A/min

&gt; Bare Si post-etch

[ ] Post-etch film is highly non-uniformed.

*Table 12*

	"N" wt / Si comp. Wt (ppm)	"N" mole / Si comp. Wt (ppm)	"N" mole / Si comp. Wt (ppm) (consider 95% TMAA and 96% TMAN)
AS_TMAA	589	4.422	4.201
TMAN	601.2	4.416	4.239



Table 13

		193 Absorbing Composition + TMAA					
Bake temp. (C)/Time (Sec.)		130/150C -- 90sec	130/175C -- 90sec	130/200C -- 90sec	130/225C -- 90sec	130/250C -- 90sec	
Metrics		ER (A/min)	ER (A/min)	ER (A/min)	ER (A/min)	ER (A/min)	
2.5% TMAH @ 21°C	1 min	-1	5	-7	-2	-3	
PGMEA @ 21°C	6 min	0.4	-0.6	-0.4	-0.2	-0.9	
500:1BOE @ 21°C	30 sec	358	251	206	165	144	
	1 min	331	273	215	191	176	

		193 Absorbing Composition + TMAN						248 Absorb. Comp.
Bake temp. (C)/Time (Sec.)		150/150C -- 50sec	130/175C -- 90sec	130/200C -- 90sec	130/225C -- 90sec	130/250C -- 90sec	130/200C -- 60sec	
Metrics		ER (A/min)	ER (A/min)	ER (A/min)	ER (A/min)	ER (A/min)	ER (A/min)	
2.5% TMAH @ 21°C	1 min	1	-3	-1	1	3	882	
PGMEA @ 21°C	6 min	-0.7	-0.2	-0.7	0.1	-0.1	21	
500:1BOE @ 21°C	30 sec	574	403	261	238	186	1140	
	1 min	552	413	312	244	198	983	

Spin Coated @7 PM on 5/22/03; Wet Process

Table 14

Descriptions		193 Absorbing Comp. + 600ppm TMAN	193 Absorbing Comp. + 600ppm Stabilized TMAA	248 Absorbing Comp.
pH		1.7	0.5	N/A
Bake temp. (C)/Time (Sec)		130/240C -- 90sec	130/240C -- 90sec	130/200C -- 50sec
DIWater Contact Angle		78.7	78.9	74.9
Metrics		ER (A/min)	ER (A/min)	ER (A/min)
2.5% TMAH @ 21°C	1 min	-7	-9	45
	2 min	-8	-10	47
500:1BOE @ 21°C	30 sec	263	277	785
	1 min	506	410	937
	2 min	413	366	720
DIWater Contact Angle		77.5	78	74.2
Metrics		ER (A/min)	ER (A/min)	ER (A/min)
2.5% TMAH @ 21°C	1 min	-10	-13	12
	2 min	-8	-1	30
500:1BOE @ 21°C	30 sec	230	174	715
	1 min	370	268	796
	2 min	370	230	670
DIWater Contact Angle		79.2	77.2	72
Metrics		ER (A/min)	ER (A/min)	ER (A/min)
2.5% TMAH @ 21°C	1 min	-10	-11	24
	2 min	-9	-7	40
500:1BOE @ 21°C	30 sec	223	215	931
	1 min	400	307	964
	2 min	405	313	[720]
DIWater Contact Angle		77.5	78.3	70
Metrics		ER (A/min)	ER (A/min)	ER (A/min)
2.5% TMAH @ 21°C	1 min	-4	1	96
	2 min	-6	-1	96
500:1BOE @ 21°C	30 sec	266	256	935
	1 min	326	274	912
	2 min	[351]	[319]	[722]

*Table 15*

Descriptions		248 Absorbing Comp.	193 Absorbing Comp. + 600ppm Stabilized TMAA	193 Absorbing Comp. + 600ppm TMAN
Bake temp. (C)		130/200C	130/240C	130/240C
DIWater Contact Angle				
Metrics		ER (A/min)	ER (A/min)	ER (A/min)
2.5% TMAH @ 21°C	1 min	67	-3	-5
	2 min	62	-2	-6
500:1BOE @ 21°C	30 sec	815	158	219
	1 min	688	171	252
	2 min	621	173	312
NE - 14 @ 21°C	30 sec	2833		
	1 min	>2815		
DIWater Contact Angle				
Metrics		ER (A/min)	ER (A/min)	ER (A/min)
2.5% TMAH @ 21°C	1 min	31	-2	-6
	2 min	49	-2	-4
500:1BOE @ 21°C	30 sec	230	154	195
	1 min	753	181	303
	2 min	[605]	188	320
NE - 14 @ 21°C	30 sec	2636		
	1 min	>2710		
DIWater Contact Angle				
Metrics		ER (A/min)	ER (A/min)	ER (A/min)
2.5% TMAH @ 21°C	1 min	74	-8	2
	2 min	80	-2	1
500:1BOE @ 21°C	30 sec	839	165	234
	1 min	742	188	282
	2 min	655	188	315
NE - 14 @ 21°C	30 sec	3040		
	1 min	>2792		

Table 16

Descriptions		248 Absorbing Comp.	193 Absorbing Comp. + 600ppm Stabilized TMAA	193 Absorbing Comp. +600ppm TMAA
Bake temp. (C)		130/200C	130/240C	130/240C
DI Water Contact Angle				
Metrics		ER (A/min)	ER (A/min)	ER (A/min)
2.5% TMAH @ 21°C	1 min	53	-2	-1
	2 min	56	1	-6
500:1BOE @ 21°C	30 sec	700	173	184
	1 min	688	156	253
	2 min	601	168	286
NE - 14 @ 21°C	30 sec	1732		
	1 min	>2825		

## Table 17

Description	248 Absorbing Comp. 248.2100.200 mm	193 Absorbing Comp. Rev A	193 Absorbing Comp. +1070ppm "optimized" APTEOS triflate	193 Absorbing Comp. +1070ppm "optimized" APTEOS triflate	193 Absorbing Comp. +1070ppm "optimized" APTEOS triflate	193 Absorbing Comp. +1070ppm "optimized" APTEOS triflate	193 Absorbing Comp. +1070ppm "optimized" APTEOS triflate	193 Absorbing Comp. +1070ppm "optimized" APTEOS triflate	193 Absorbing Comp. +1070ppm "optimized" APTEOS triflate	193 Absorbing Comp. +1070ppm "optimized" APTEOS triflate	193 Absorbing Comp. +1070ppm "optimized" APTEOS triflate
pH	N/A	1.5	<2	<2	<2	<2	<2	<2	<2	<2	<2
Bake Sequence	130/200°C	130/200°C	130/180°C	130/200°C	130/200°C	130/200°C	130/200°C	130/220°C	130/240°C	130/250°C	130/280°C
	50 sec	90 sec									
500:1 BOE	ER	ER	ER	ER	ER	ER	ER	ER	ER	ER	ER
	748	[1568]	[1405]	[1354]	1311	[1111]	912	884	[850]		
TMAH											
	76	57	82	72	31	36	-1	2	27		
	780	100	144	105	90	45	-8	19	4		
2.3% aq. TMAH	1931	781	797	622	446	372	228	179	129		
5.0% aq. TMAH	no data	43	37	81	1	21	-15	20	0		
	>3522	298	347	256	222	123	47	38	46		
	>3566	1212	1261	789	782	624	406	321	211		
10.0% aq. TMAH	>3511	166	196	93	60	52	12	26	14		
	>3536	716	766	704	485	294	205	115	41		
	>3571	>2706	[1981]	[1493]	1282	900	745	462	332		

Table 18

Description	248 Absorbing Comp. 248.2100.200 mm					193 Absorbing Comp. Rev A +1070ppm "optimized" APTEOS triflate + 1.5% DPG					193 Absorbing Comp. Rev A +1070ppm "optimized" APTEOS triflate + 1.5% DPG					193 Absorbing Comp. Rev A +1070ppm "optimized" APTEOS triflate + 1.5% DPG				
	N/A					<2					<2					<2				
pH	130/200°C					130/180°C					130/200°C					130/220°C				
	50 sec					90 sec					90 sec					90 sec				
Bake Sequence	1 min @					ER					ER					ER				
	20° C					[846]					[1439]					[1282]				
500:1 BOE	1 min @																			
	23° C					78					74					75				
2.3% aq. TMAH	50° C					393					386					146				
	75° C					1988					2567					1483				
5.0% aq. TMAH	23° C					818					110					54				
	50° C					>3509					959					400				
10.0% aq. TMAH	75° C					>3484					>2862					>2867				
	23° C					>3486					503					105				
	50° C					>3509					959					400				
	75° C					>3474					>2804					>2819				
																>2821				
																1616				
																1283				

Table 19

Description	248	193	193	193	193	193	193	193	193	193
	Absorbing Comp. 248.2100.200 mm	Absorbing Comp. Rev A	Absorbing Comp. +1070ppm "optimized" APTEOS MSA + 1.5% DPG	Absorbing Comp. +1070ppm "optimized" APTEOS MSA + 1.5% DPG	Absorbing Comp. +1070ppm "optimized" APTEOS MSA + 1.5% DPG	Absorbing Comp. +1070ppm "optimized" APTEOS MSA + 1.5% DPG	Absorbing Comp. +1070ppm "optimized" APTEOS MSA + 1.5% DPG	Absorbing Comp. +1070ppm "optimized" APTEOS MSA + 1.5% DPG	Absorbing Comp. +1070ppm "optimized" APTEOS MSA + 1.5% DPG	Absorbing Comp. +1070ppm "optimized" APTEOS MSA + 1.5% DPG
pH	N/A	1.5	<2	<2	<2	<2	<2	<2	<2	<2
	130/200°C	130/200°C	130/180°C	130/200°C	130/220°C	130/240°C	130/250°C	130/280°C		
Bake Sequence	50 sec	90 sec	90 sec	90 sec	90 sec	90 sec	90 sec	90 sec	90 sec	90 sec
	ER	ER	ER	ER	ER	ER	ER	ER	ER	ER
500:1 BOE	748	[1568]	[1385]	1086	852	801	800	755		
TMAH										
2.3% aq. TMAH	76	57	54	26	12	-5	21	-3		
	780	100	131	48	36	-35	20	-7		
	1931	781	1129	507	518	201	242	226		
5.0% aq. TMAH	no data	43	46	23	4	-24	13	17		
	>3522	298	444	115	78	-15	28	10		
	>3566	1212	>2889	695	686	372	466	383		
10.0% aq. TMAH	>3511	166	94	26	32	-6	-6	12		
	>3536	716	906	387	168	58	82	-19		
	>3571	>2706	>2831	[1515]	1172	746	970	513		

Table 20

Materials	pH	Days at 40C	Mn	Mw	Mp	Mz	Mz+1	PDI
193 Absorb. Comp. Rev A + 1070ppm "opt" apteos triflate	1.732	0	780	1109	735	1488	1844	1.422
		5	1062	1568	1329	2188	2853	1.476
193 Absorb. Comp. Rev A + 1070ppm "opt" apteos triflate +1.5% DPG	<2	0	891	1269	754	1722	2179	1.424
		7	1058	1486	1198	1995	2520	1.404
193 Absorb. Comp. Rev A + 1070ppm "opt" apteos msa +1.5% DPG	<2	0	880	1241	749	1680	2127	1.41
		7	1006	1410	1175	1887	2364	1.402
5 days at 40C 193AC	Mn	Mw	110 nm via fill					
pH1.5 + 2000ppm nitric acid acidified TMAA	1289	1641	No voiding					



Table 21

Description	248 Absorbing Comp. 248.2100.200 mm	193 Absorbing Comp. Rev A	193 Absorbing Comp. pH 5.5	193 Absorbing Comp. Rev A + 1070ppm + APTEOS Nitrate	193 Absorbing Comp. Rev A + 1070ppm + APTEOS Nitrate + 1.5% DPG	193 Absorbing Comp. Rev A + 1070ppm + APTEOS Nitrate + 3% DPG	193 Absorbing Comp. Rev A + 1070ppm + APTEOS Nitrate + 6% DPG	193 Absorbing Comp. Rev A + 1070ppm + APTEOS Nitrate + 9% DPG
pH	N/A	1.5	5.5	<2	<2	<2	<2	<2
Bake Sequence	130/200°C	130/200°C	130/240°C	130/240°C	130/240°C	130/240°C	130/240°C	130/240°C
	50 sec N2	90 sec N2	60 sec N2	90 sec N2	90 sec N2	90 sec N2	90 sec N2	90 sec N2
500:1 BOE	1 min @ 20° C	ER	ER	ER	ER	ER	ER	ER
		675	[1568]	422	[545]	571	681	626
TMAH	1 min @	Pre	ER					
2.3% aq. TMAH	23° C	2694	57	28	-7	40	56	62
	50° C	2663	100	42	6	28	20	26
	75° C	2702	781	117	356	224	347	463
5.0% aq. TMAH	23° C	485	2679	43	-5	32	13	10
	50° C	>3536	2723	298	18	17	21	13
	75° C	>3527	2699	1212	508	259	524	776
10.0% aq. TMAH	23° C	>3461	2687	166	-2	20	36	14
	50° C	>3469	2670	716	81	106	50	80
	75° C	>3514	2706	>2706	1040	546	1075	1573

Table 22

Description	Thickness	1 dev	Reflectance @ 193nm	n @ 193nm	k @ 193nm
193 Rev A	1469	12.2	9.77	1.8027	0.3811
193 Rev A + 1070 ppm APTEOS Triflate	1502	15.4	10.26	1.8019	0.3469
193 Rev A + 2140 ppm APTEOS Triflate	1514	12.1	10.33	1.7945	0.3304
193 Rev A + 5350 ppm APTEOS Triflate	1509	15.4	10.18	1.7931	0.3362
193 Rev A + 8025 ppm APTEOS Triflate	1512	9.7	10.19	1.7918	0.3329
193 Rev A + 10700 ppm APTEOS Triflate	1506	12.7	10.15	1.7958	0.3427
193 Rev A + 25000 ppm APTEOS Triflate	1500	12.2	10.14	1.7998	0.3526
193 Rev A + 40000 ppm APTEOS Triflate	1533	10.5	10.16	1.7793	0.3276

Table 23

ppm APTEOS Triflate	40C Aging	Mn	Mw	Mp	Mz	Mz+1	Polydispersity
193 Rev A + 1070 ppm APTEOS Triflate	0	920	1283	759	1724	2173	1.395362
	5	1279	1681	1405	2174	2706	1.314284
193 Rev A + 2140 ppm APTEOS Triflate	0	754	1119	744	1562	2000	1.483957
	5	955	1378	788	1897	2455	1.442483
193 Rev A + 5350 ppm APTEOS Triflate	0	876	1226	754	1640	2046	1.3994
	5	984	1367	779	1819	2268	1.38917
193 Rev A + 8025 ppm APTEOS Triflate	0	877	1228	754	1646	2058	1.40051
	5	988	1369	1112	1812	2247	1.38518
193 Rev A + 10700 ppm APTEOS Triflate	0	875	1226	755	1642	2052	1.40143
	5	1001	1396	1156	1860	2320	1.3942
193 Rev A + 25000 ppm APTEOS Triflate	0	846	1204	764	1635	2060	1.42421
	5						
193 Rev A + 40000 ppm APTEOS Triflate	0	835	1169	755	1930	1930	1.39928
	5	846	1260	773	1726	2168	1.489298

Table 24

Description	248 Absorbing Comp. 248.2100.200 mm		193 Absorbing Comp. Rev A		193 Absorbing Comp. Rev A + 10,700ppm APTEOS triflate (10x)		193 Absorbing Comp. Rev A + 40,000ppm APTEOS triflate (37x)	
	pH	N/A	130/200°C 50 sec N2	130/200°C 90 sec N2	130/240°C 90 sec N2	130/240°C 90 sec N2	<2.5	<2.5
500:1 BOE TMAH	1 min @ 20° C	ER	ER	ER	ER	ER	ER	ER
		751	[1568]	[1568]	776	[1116]	[1116]	[1116]
	1 min @							
2.3% aq. TMAH	23° C	5357	57	57	22	45	45	45
	50° C	493	100	100	-8	95	95	95
	75° C	1488	781	781	334	[2252]	[2252]	[2252]
5.0% aq. TMAH	23° C	287	43	43	-25	-6	-6	-6
	50° C	[1604]	298	298	69	809	809	809
	75° C	[2639]	1212	1212	309	2709	2709	2709
10.0% aq. TMAH	23° C	>3491	166	166	-8	17	17	17
	50° C	>3427	716	716	162	878	878	878
	75° C	>3443	>2706	>2706	1440	>2912	>2912	>2912